AVIATION WEEK
A McGRAW-HILL PUBLICATION
APRIL 19, 1948

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BG spark plugs fly with Northwest "Overland to the Orient"

For many years, Northwest Airlines, Inc., have used BG spark plugs. Whether installed in their new fleet of Martins or other planes, BG spark plugs continue to demonstrate the dependability, low-maintenance cost, long life and high efficiency which have made them standard equipment on major airlines the world over.

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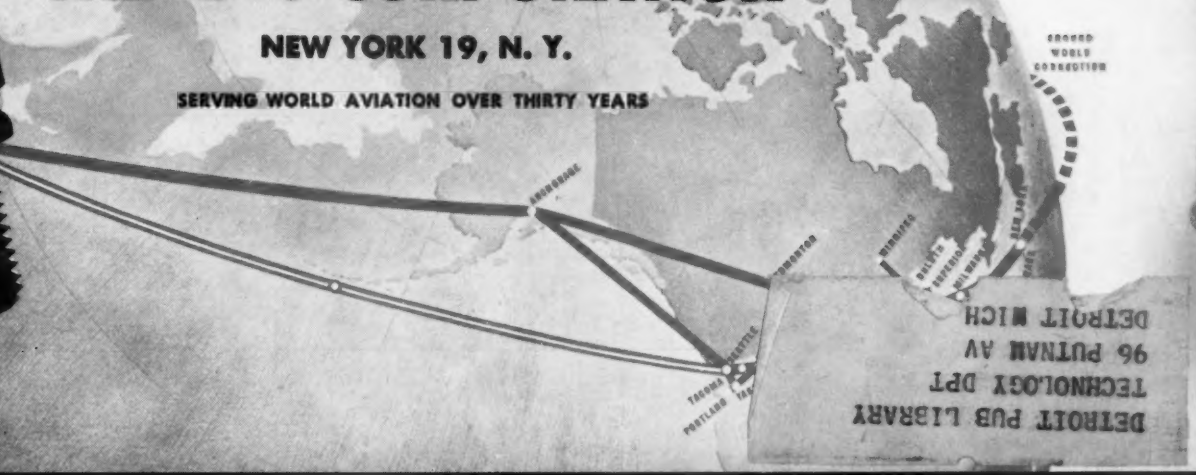

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TECHNOLOGY DPT
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DETROIT MICH

This is the turbine wheel and shaft for one of the latest, most powerful jet engines—General Electric's TG-180. The turbine wheel is 34 inches in diameter. This component, as well as the nozzle diaphragm and many-bladed rotor and stator compressor assemblies of the engine, are built by Thompson Products to rigid specifications for smooth, vibrationless performance while turning out the equivalent of 5000 h.p.

THE LITTLE BLADE, shown above in actual size, is one of the 125 that go into the TG-180 turbine wheel. The high temperatures and stresses under which these parts operate would weaken ordinary steel to the point of uselessness. Yet these small, thin blades run red hot, whirl up to 15,000 r.p.m.—must withstand centrifugal "tearing-apart" strains of *15 tons per square inch!*

The fine alloys and precision production methods that make these parts possible have resulted from years of research carried on by Thompson Products. And the continuation of Thompson research in metallurgy and engineering will bring about further improvements in materials, design and production for swifter, safer air transportation.

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Research keeps
B.F.Goodrich
FIRST IN RUBBER

Why globe trotters wear rubber boots

THE FIRST plane to fly 'round-the-world on scheduled airline service was the "Clipper America", shown above. On that pioneer trip, this plane wore B. F. Goodrich De-Icer boots to protect it against icing conditions.

Today, all globe-trotting scheduled airliners are equipped with De-Icers for safer, more dependable flights.

De-Icers fit snugly on the leading edges of wings and empennage, where most ice forms. Inside the De-Icer, a series of air-driven tubes inflates and deflates, flexing the rubber. This cracks and frees any ice that has formed on the leading edges, and the air stream carries it away.

This simple system has proved so safe and efficient that today practically every airliner requiring ice protection is equipped with B. F. Goodrich De-Icers. Many twin-engine private planes also use De-Icers to cut delays, increase availability and provide added safety.

De-Icers are light weight and take up little space for their plumbing. They are operated safely—by cool air under low pressure. They are easily maintained and low in cost. Tailor-made De-Icers can be quickly installed on planes that have built-in plumbing. And complete De-Icer systems, including the latest improvements, can be designed for new models.

In the 20 years since B. F. Goodrich engineers first developed the De-Icer they have made it steadily better. Constant research, plus the experience gained in turning out over 100,000 sets of De-Icers, make today's De-Icers the safest ice-removal device for airplane leading edges yet developed. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

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Keep out of trouble!

specify

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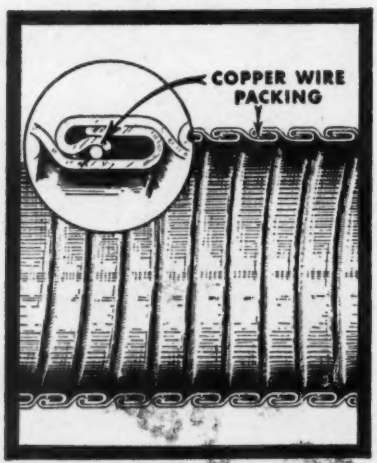
bendable pipe for exhaust tubing



Schematic drawing of cut-out section of TITEFLEX Bendable Pipe, with enlarged view showing construction.

Exhaust tubing made from TITEFLEX Bendable Pipe is as leak-proof as tubing can be —for the joints in TITEFLEX Bendable Pipe are made pressure tight with special copper wire packing that cannot disintegrate under high temperatures. Because of its all-metal construction, TITEFLEX Bendable Pipe is practically indestructible under ordinary service conditions.

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AVIATION WEEK

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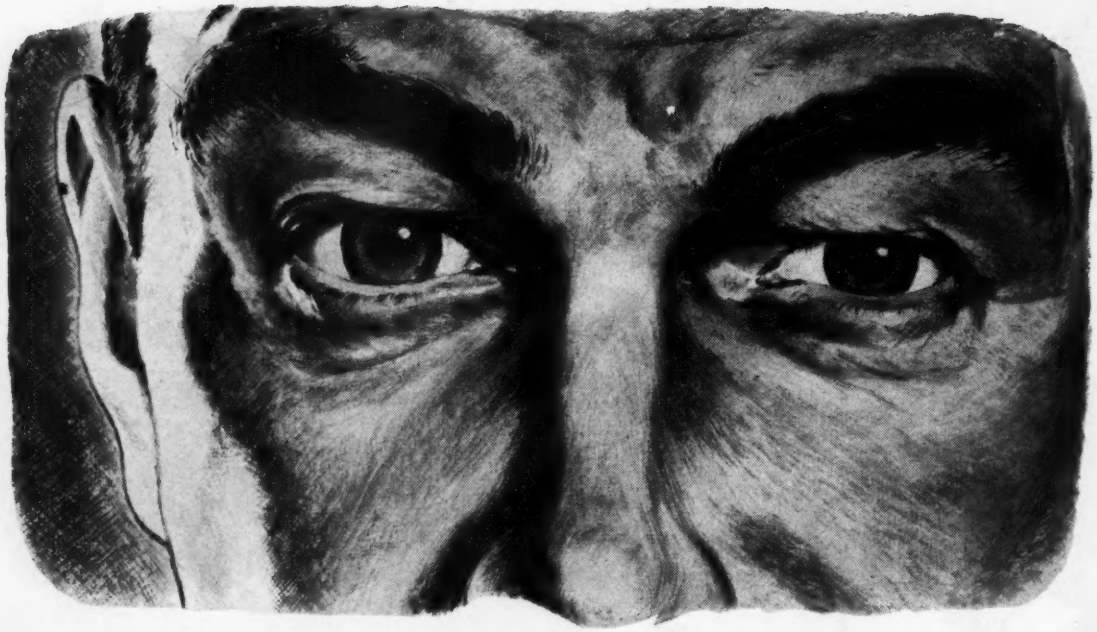
AVIATION GASOLINE



Let's look at the case of airline X

WITH its fleet of 26 prewar twin-engine airliners, airline X* was losing money each month. To meet this problem, airline X replaced its 26 obsolete planes with 12 Martin 2-0-2's. What was the result? The figures below speak for themselves.

	USING MARTIN 2-0-2	USING STANDARD PREWAR PLANE
No. of Airplanes in Fleet	12	26
Average Trip Length—Miles	400	400
Cruising Speed (60% NRP at 10,000') MPH	253	191
Block Speed—MPH (10 MPH Headwind)	219	168
Airplane Utilization—Hrs./Yr.	3650	3650
Passenger Seats/Airplane	36	21
Available Seat Miles/Yr.	345,000,000	335,000,000
Seat Miles at 60% Load Factor	207,000,000	201,000,000
Direct Flying Cost/Airp. Hr.	$98.22	$58.08
Indirect Expense—125% Direct	$122.78	$72.60
Total Cost/Airp. Hr.	$221.00	$130.68
Operating Expenses/Yr./Fleet	$9,680,000	$12,400,000
(Note: Revenue figures do not include mail, express and freight.)		
Revenue/Yr. at 85% L. F. and 5.5 cents/Pass. Mi.	$16,130,000	$15,660,000
Gross Profit	$6,450,000	$3,260,000
Revenue/Yr. at 80% L. F. and 5.5 cents/Pass. Mi.	$15,180,000	$14,740,000
Gross Profit	$5,500,000	$2,340,000
Revenue/Yr. at 70% L. F. and 5.5 cents/Pass. Mi.	$13,280,000	$12,900,000
Gross Profit	$3,600,000	$500,000
Revenue/Yr. at 65% L. F. and 5.5 cents/Pass. Mi.	$12,330,000	$11,980,000
Gross Profit	$2,650,000	(–) $420,000
Revenue/Yr. at 60% L. F. and 5.5 cents/Pass. Mi.	$11,390,000	$11,060,000
Gross Profit	$1,710,000	(–) $1,340,000

*THOUGH above figures for hypothetical airline X are based on ATA formula, figures based on actual operating costs of the 2-0-2 are even lower. The Glenn L. Martin Company, Baltimore 3, Maryland.

Martin
AIRCRAFT
Builders of Dependable Aircraft Since 1909

NEWS SIDELIGHTS

Tobey vs. Brewster

Sen. Charles Tobey (R., N. H.) is working assiduously behind the scenes to get Sen. Owen Brewster (R., Me.) ousted as chairman of the aviation subcommittee of Senate Interstate and Foreign Commerce Committee. During the recent illness of Sen. Wallace White (R., Me.), Tobey served as acting chairman of Senate Interstate, and refused to assign aviation matters—authorization of Loran and ocean stations—to the regular aviation subcommittee of which Brewster is chairman. He did, however, appoint Brewster to the informal subcommittees he named to consider various, comparatively minor, aviation matters. White can be counted upon to stand behind Brewster and insist that the full-scale legislative program, recommended by the joint Congressional Aviation Policy Board, be handled by the regular aviation subcommittee.

Pacific Blues?

United Air Lines President W. A. Patterson still believes that any carrier certificated for a Pacific Northwest-Hawaii route in CAB's upcoming decision on the case will be getting a highly undesirable franchise. Matson Navigation Co., Pan American Airways, Northwest Airlines and Transocean Air Lines are seeking the link which UAL feels it could not operate without "losing its shirt" because of lean traffic.

Changeable Minds

The changing mind of the National Defense Establishment is keeping Congressmen on the jump these days in their earnest effort to get facts on the defense needs of the country. Two weeks ago members of the Senate Armed Services Committee proposed to Defense Secretary James Forrestal that, in view of the uneasy international situation, immediate funds should be made available for aircraft procurement to start industry expansion. Forrestal replied: "We had considered coming down to ask for a supplemental appropriation . . . but the actual gain in time, in terms of contracts let, would, in our opinion not be sufficient to warrant that additional burden upon you." Last week Forrestal testified before the House Appropriations Committee that the $725,000,000 supplemental for aircraft procurement requested by the President was of utmost urgency and President Truman hurriedly proposed the $2,376,000,000 for aircraft procurement funds in the 1949 budget to be voted immediately to "save from 3 to 6 months" in getting the aircraft industry expansion under way.

LeMay's Tests

Hard-headed Lieut. Gen. Curtis E. LeMay, Air Force Commander in Europe, has been sending his B-29s against England in unpublicized maneuvers to test their vulnerability in attacks on heavily defended targets. England's Royal Air Force is equipped with superior jet interceptors and probably the best radar and fighter control network in the world. B-29s attacking singly over widely scattered targets in England have been surprisingly successful. Coming around 35,000 feet at night only 60 percent of the attacking bombers have been picked up by radar and only 40 percent successfully attacked by defending fighters. With the 6000 mile range of B-29s now available through aerial refueling techniques and adequately located bases for shuttle bombing across the Eurasian heartland, the results of the English tests should make the Russians think twice about their air defenses. LeMay is best known for his unorthodox bomber tactics, having led the first B-17 missions against Germany beyond fighter cover and ordering the B-29s to begin firebomb attacks on Japan from 5000 ft, without defensive armament under cover of darkness.

Navy Loses Vinson

Recent rock-ribbed Navy supporters on Capitol Hill are now lining up behind the Air Force by the scores. Three notable converts to air dominance in national defense strategy last week were Georgia's Rep. Carl Vinson (D.), former chairman of the House Naval Affairs Committee, New York's Rep. Sterling Cole (R.) and Massachusetts' Rep. George Bates, former members of House Naval Affairs. Vinson, a member of the board which tried the late "Billy" Mitchell and long renowned as a powerful advocate of "battleship" strategy, switched in position during the war years to advocacy of the aircraft carrier as the "spearhead" for operations, but continued to minimize the effectiveness of strategic air force bombing. Vinson is now an all-out proponent of the 70-group Air Force to emphasize strategic bombing operation in the national defense. Cole and Bates, two of Vinson's followers, have followed his lead.

Pressure for Cargo

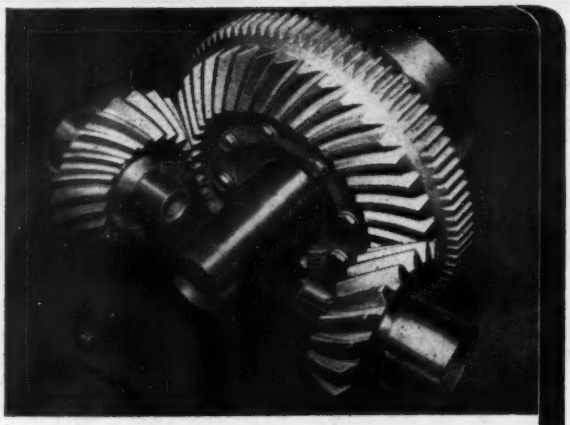
Speedup in the rearmament tempo and growing concern over the adequacy of the nation's air lift capacity in an emergency is resulting in heavy pressure on CAB to throw the air cargo industry wide open. Air Force attitude definitely favors encouragement by CAB of independent airfreight lines. Thomas J. Finletter, chairman of the President's Air Policy Commission, and William J. Donovan, head of the wartime Office of Strategic Services, are actively backing the cargolines' fight for certification. Meanwhile, the Air Force is studying plans for channeling maximum government cargo business to commercial airlines. Suggestions have been made that the government pay a premium rate on its shipments so that the carriers can offer the lowest possible airfreight tariffs to private customers—well below 10 cents a ton mile—and still make an overall profit.

Progress of Air Power

Efforts of the Navy to catch up with the Air Force on air power have resulted in the resurrection from musty files, of a 50-year-old letter from Theodore Roosevelt, then Assistant Secretary of the Navy. The letter, reproduced in a recent Navy press release, asked appointment of a board to make recommendations on possible military uses of a full scale airplane developed from the Langley acrodrome scale model which had recently flown.

"Foresight shown by Mr. Roosevelt planted seeds of interest in the minds of Naval officers," the accompanying release says. "Naval aviation in its present status is an operating result of that interest."

Thus, neatly and lightly, it passed over the Navy's air power policy record from 1920 to 1940—a record of fierce and bitter opposition to air power, by the Navy's top policy makers—the battleship admirals, who greatly retarded the effective use of military aviation.



Typical custom-built Pacific-Western precision-quality aircraft parts designed and manufactured to meet highly specialized customer requirements.

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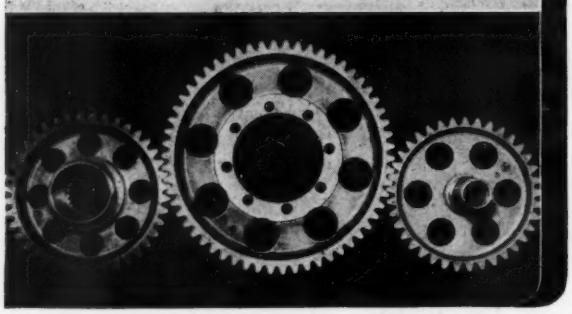
PACIFIC-WESTERN Aircraft Gearing



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GEAR PRODUCTS

NEWS DIGEST

DOMESTIC

TWA has taken delivery well ahead of schedule on the first of 12 new Lockheed Constellations, type L-749. Planes are to be placed in trans-Atlantic service by summer, have sleeping accommodations for 20 passengers.

Air Line Pilots Association has filed two suits against National Air Lines. First asks $1,000,000 damages for financial losses incurred by union as a result of alleged noncompliance with Federal laws, by NAL. Second suit asks for unspecified amount due in back pay for pilots on strike since Feb. 3.

Department of Agriculture used planes to reseed 2100 acres of burned pine forest lands in Maine, badly damaged by fires of last fall.

Braniff Airways has reinstated DC-6 service between Dallas and Chicago, the first Braniff DC-6 flights since the planes were grounded last November.

Personal Aircraft Council has added three engine manufacturers, Continental, Aircooled, and Lycoming, to its list of members.

FINANCIAL

The Mengel Co. reported net profit for 1947 of $2,296,000 or $3.95 per share on sales totaling $35,292,000.

Stewart-Warner Corp. reports net profit for 1947 of $2,436,634 or $1.88 a share on sales totaling $76,930,304. Working capital as of Dec. 31, 1947 totaled $15,546,746.

Stromberg-Carlson Co. announced net income for 1947 of $1,084,194 or $3.50 a share on sales of $32,190,872.

FOREIGN

KLM (Royal Dutch Airlines) has stepped up New York-Amsterdam service to six round trips weekly, with a peak of nine round trips weekly scheduled during top tourist season in June.

In action reminiscent of a motion picture thriller, 20 Czechs captured a Czech National Airlines plane at gunpoint in midair, and flew it to Munich in the U. S. zone in Germany, to escape from Communism in the home land. Six others aboard elected to return to Prague.

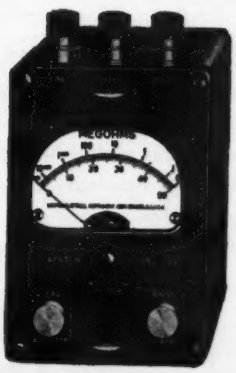
Two German planes, a Messerschmitt 163 and a Heinkel Volksjaeger, in a hangar at Winnipeg, Canada, are the first in a collection started by the RCAF for a museum of planes which fought in World War II.

Britain has appointed Air Marshal Sir H. S. P. Walmesly deputy chief of the Air Staff.

INSTRUMENTS FOR
ELECTRONIC MAINTENANCE

WESTON *Electronic Analyzer* — Model 769. Incorporating: 1. A conventional Volt-Ohm-Milliammeter with self-contained power source. 2. A high-impedance electronic Volt-Ohmmeter using 115 volt, 60 cycle power. 3. A stable, probe-type, Vacuum Tube Voltmeter, for use to 300 megacycles.

WESTON *Multi-Purpose TUBECHECKER* — Model 798. This universal tubechecker offers within one instrument provision for testing: 1. Receiving tubes. 2. Voltage regulator tubes. 3. Light duty thyratron tubes such as 2A4—6D4—884—885—2051. Scale is calibrated "Good-Bad" as well as in mutual conductance readings.



Direct Reading Insulation Tester — Model 799. Compact, one-hand-operated insulation tester with .1 to 10,000 megohm range, using a test potential less than 50 volts d-c. Indicates: 1. Insulation properties. 2. Leakage resistance. 3. Conductivity of insulating materials. 4. Leakage due to moisture absorption.

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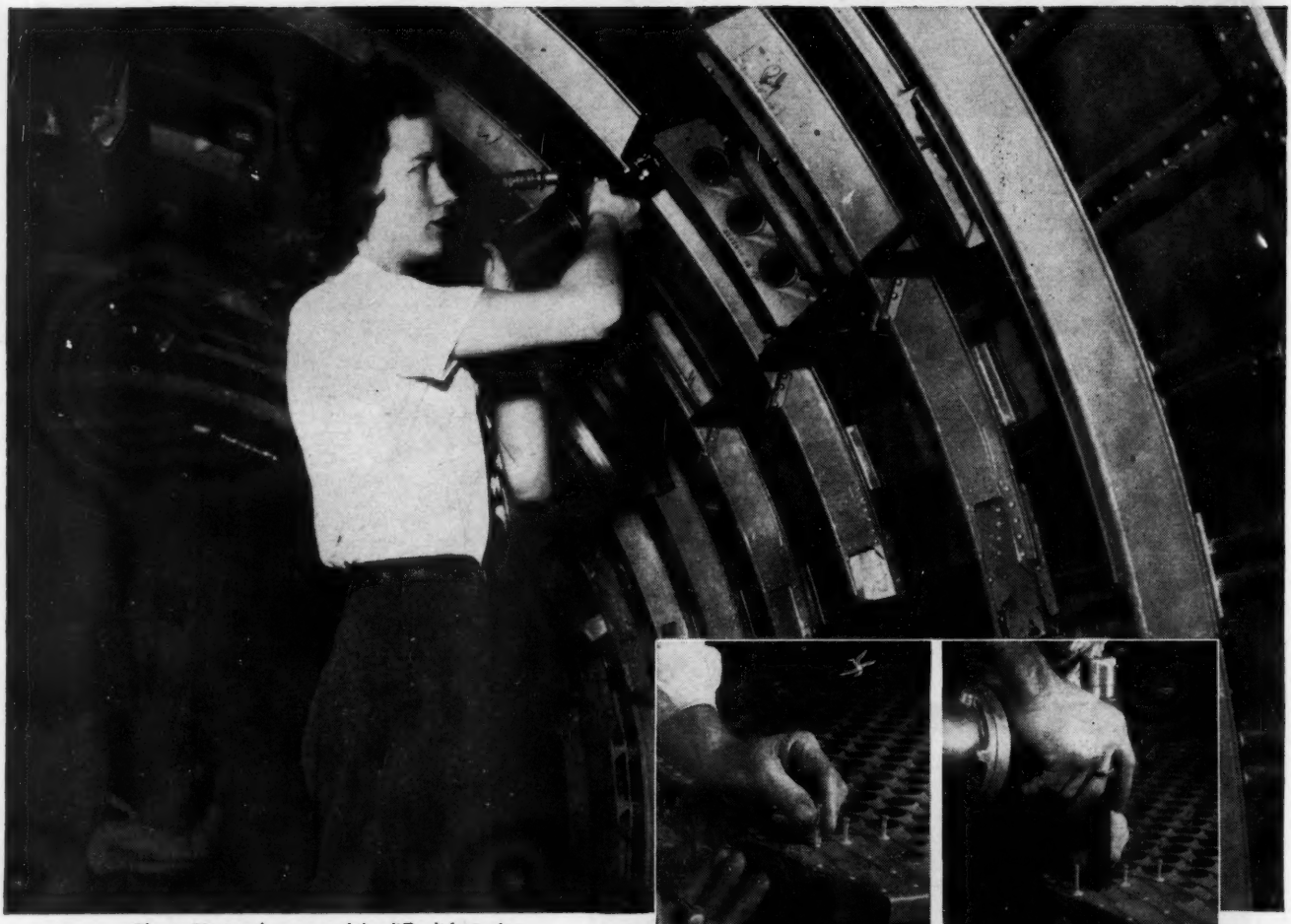
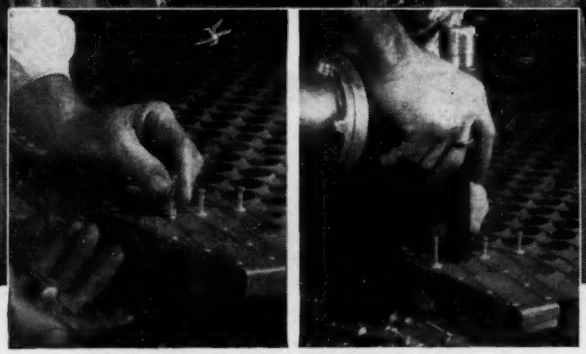


Cherry Rivets solve many of the difficult fastening problems on the Douglas DC-6 Transports.



Insert the rivets in the drilled holes. With the gun, pull the stem. This expands the rivet into the sheets to be fastened and forms a "tulip head" on the blind side of the work.

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SPECIAL CHARACTERISTICS of Cherry Blind Rivets give you a better blind-fastening process on assembly lines. Cherry Rivets are designed with more shank expansion . . . that means tighter, vibration-resistant joints. They have greater hole-diameter and grip-length tolerances . . . that means more latitude for all types of assembly jobs. Cherry Rivets are available in *more* rivet types, *greater* range of diameters, and in the *largest* number of grip lengths for aviation production lines.

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Vol. 48, No. 16

AVIATION WEEK

April 19, 1948

New employment line at Boeing-Wichita: Two billion dollars will make it longer. (IN photo)

Orders Are Coming for Aircraft Industry

Two billion dollar procurement bill readied for speedy passage as Forrestal urges rapid build-up of industry.

By ROBERT HOTZ

Preparations for the swift flow of $2,376,100,000 into the aircraft industry were well advanced on Capitol Hill last week as the fight for a 70-Group Air Force was temporarily eclipsed by a rush order to pour procurement funds into manufacturers contracts.

Among significant developments:

• Bill for $2,376,100,000 in aircraft procurement funds for the Air Force and Naval Aviation was rushed to the House floor for a vote with speedy passage through both House and Senate assured. The bill would make procurement appropriations in the fiscal 1949 budget available immediately. Air Force would get $1,483,100,000 with $903,000,000 for Naval air.

• Air Secretary Symington told the House Armed Services Committee that Russia was outbuilding the United States in aircraft by a 12 to 1 margin and was striving to reach a decision with this country in the air.

• Maj. Gen. Oliver P. Echols, retired Air Force procurement chief, and now president of the Aircraft Industries Association, has been working as a special consultant to Defense Secretary Forrestal on studies aimed:

1. At setting up a permanent aircraft committee of the Munitions Board to replace present interdepartmental aviation groups and handle allocations of manpower, materials etc., in a program integrating Air Force and Naval Aviation requirements with the industry's capacity.

2. Determining the expansibility of the aircraft industry in terms of its present plant facilities, skilled manpower available, and among other things, need for controls and material allocations.

It is expected that the Munitions Board aircraft committee will be organized on a permanent basis shortly and will carry on the functions of the Joint Aircraft Committee of the National Defense Council of 1940 vintage.

• Blasts by Navy Admirals Louis Denfeld, chief of Naval Operations and Daniel Gallery, Navy guided missiles chief, at Air Force expansion. Gallery's statement pointed out that the sea-going Navy was now obsolete and must find some other excuse for existence. He recommended that the Navy take over exercise of strategic airpower while the Air Force be confined to defense of the Continental United States. Although Gallery's statement was repudiated by top ranking Navy chiefs, it was generally recognized as the traditional statement of Navy's own concept of its role.

• Rep. Paul Kilday (D. Tex.), a member of the Congressional Air Policy Board, introduced the Air Force Act of 1948 (HR 6158) calling for a permanent regular Air Force of 70-Groups and 22 separate squadrons with 597,000 officers and men and 225,000 airframe tons in serviceable aircraft plus an annual procurement of 42,500 airframe tons.

► **Forrestal Plea**—Defense Secretary James Forrestal made a strong plea before the House Armed Services Committee for immediate enactment of the two billion dollar aircraft procurement legislation on the grounds that it would eventually save from 3 to six months in getting an expanded production program under way and would act as a catalyst in reviving the now stagnant aircraft industry.

National Military Establishment,
Supplemental Estimate, 1948-49 fiscal year

	1949 Budget	Supplemental Estimate	Revised Budget
U. S. Air Force:			
Procurement of airplanes complete	$700,000,000	[1]$440,000,000	$1,140,000,000
Procurement of materiel and equipment Army.	10,000,000		10,000,000
Salaries, procurement and production	7,800,000		7,800,000
Procurement of communication equipment..	35,500,000	10,000,000	45,500,000
Procurement of controlled missiles	10,300,000		10,300,000
Industrial and procurement planning	4,500,000		4,500,000
Transportation to first destination	5,000,000		5,000,000
TOTAL, AIR FORCE	$773,100,000	$450,000,000	$1,223,100,000
U. S. Navy:			
Procurement of piloted aircraft	$463,700,000	$275,000,000	$738,700,000
Procurement of pilotless aircraft	9,300,000		9,300,000
Equipment for service schools	1,000,000		1,000,000
Industrial mobilization..	4,000,000		4,000,000
TOTAL, NAVY	$478,000,000	$275,000,000	$753,000,000
GRAND TOTAL	$1,251,100,000	$725,000,000	[2]$1,976,100,000

[1] *Includes $25,000,000 for special modifications of aircraft.*
[2] *Does not include appropriation estimate to liquidate prior year's contract authority: air force, $250,000,000; navy, $150,000,000.*

Forrestal said the production program would be the quickest way to spot bottlenecks in the aircraft industry and lead to their speedy solution. He also warned that while the two billion dollar procurement program would probably not require manpower or material controls that anything above that figure might necessitate rigid government controls. He emphasized that the present national economy had little elasticity and any greatly increased demand on its productive capacity would again stimulate inflations and require strict government controls.

Arthur S. Barrows, Undersecretary of the Air Force in charge of procurement, told the committee that the problem was to place $1,115,000,000 in Air Force procurement contracts just as soon as possible to prevent further recessions in the aircraft industry. Barrows said the contracts would be for improved versions of planes already available. He revealed that the Boeing B-50B was already in production with a B-50 C and D models already in the planning stage.

Maj. Gen. K. B. Wolfe, said the Air Force would issue letters of intent for its procurement funds within 30 to 60 days after the law was passed. Navy estimates said they would require until Oct. 1 to dispose of all their procurement funds.

Air Force Comptroller Lieut. Gen. Edward Rawlings, pointed out that the Forrestal proposal still fell $992,000,000 short in procurement funds for the Air Force 70-Group program. Rawlings pointed out that the Air Force now had sufficient planes to man 70 groups but that most of them were obsolete. He said it would be possible to equip 70 groups with modern aircraft by 1953 if necessary procurement funds were available.

Approximately $150,000,000 will be spent by the Air Force in providing manufacturers with machine tools necessary to fulfill their contracts. Title to the tools will remain with the Air Force.

► **May Ask More**—Forrestal emphasized that the two billion dollar procurement program was planned primarily as an immediate catalyst for the industry and that additional procurement recommendations would depend on results of a study now under way by the Joint Chiefs of Staff and the possible effects of such a program on the present national economy. He said he did not think an annual plane production of 3200 was too high a figure for planning.

Figures on aircraft costs submitted showed Air Force planes averaged $50 per airframe pound while the Navy's cost $62.11 per lb. As of April 6 the Navy had $117,000,000 in unobligated funds from its fiscal 1948 budget with the Air Force carrying $194,600,000 in unobligated funds, largely for government furnished equipment for which contracts have not yet been let.

New International Group Proposed

Edward P. Warner, ICAO president, has voiced a plea for an international aircraft manufacturer organization to present airframe knowledge in ICAO discussions—a presentation which is now largely lacking. Warner spoke to the AIA technical committee groups in Washington last week on the outlook for international airworthiness standards.

Pointing out that the ICAO charter prohibits the formal presentation of views held by such organizations as Aircraft Industries Association, Society of British Aircraft Constructors, etc. because they are only national in scope, Dr. Warner suggested immediate steps be taken for the formation of a truly international group to present to ICAO industry recommendations on airworthiness standards.

Observers expressed doubts that such an organization could be formed due to wide divergence of trade association philosophies in England, France, Canada and the U. S.

Although much work remains to be done before an airworthiness document can be presented to member governments, Warner expressed confidence that such agreement would be realized at the coming meeting of the ICAO airworthiness division in September. In his opinion, these requirements will probably closely parallel those of CAR Part 04 and Part 41.

Admiral John Towers Becomes PAA Executive

Admiral John H. Towers, USN (Ret.), has been elected assistant vice president of Pan American Airways.

Active in Naval aviation since 1911, Towers was assistant director of the Navy's air program in World War I. In 1939-42 he was chief of the Bureau of Aeronautics and in 1944 was made second in command to Admiral Nimitz as deputy commander of the Pacific Fleet. Subsequently, he commanded the Pacific Fleet's carrier task forces; and in 1946 he became commander-in-chief of the Pacific Fleet.

Del Rentzel:

New Vigor for CAA

Bureaucratic stodginess of the Civil Aeronautics Administration appears due for a rude awakening when the vigorous 38-year-old Texan, Delos Wilson Rentzel, recently nominated as Administrator, takes over.

Forecasts last week were that Rentzel's nomination by President Truman probably would get Senate confirmation without serious opposition. It appears likely he will take office in May.

How long he will hold that office however depends primarily on chances of proposed legislation completely revamping the Federal Aeronautics Agency into a division of the Department of Commerce. Legislation has the backing of the powerful Congressional Air Policy Board, original proposer of the revamping.

▶ **Reorganization Forecast**—If Congress returns after the Republican National Convention, as seems likely, CAA organization appears to have a good chance of being enacted. There would then be only one post, Director of Civil Aviation, with two officials to fill it, the Assistant Secretary of Commerce for Air John R. Alison, and the Administrator. Secretary of Commerce Averell Harriman picked Alison originally, and since his post is higher up the ladder than that of the Administrator, Alison probably would be favored over Rentzel if it came to such a showdown.

Past record of the new administrator nominee indicates that if he has time to get set in his new job, CAA will have a firm, executive hand on the controls. In organizing Aeronautical Radio de Mexico, and similar radio service facilities in other countries, he has had considerable exposure to political maneuverings which may alert him to some of the goings-on in CAA.

▶ **Aerinc President**—Interviewed at his office at Aeronautical Radio, Inc. where he still retains the presidency pending action on his appointment, "Del" Rentzel stretched his six foot-two height out in a swivel chair and talked the usual new appointee's talk about not taking any action until he had time to get in and look around and find out what was going on.

Rentzel thinks that the constant shifting of personnel between government and industry which goes on in the Federal Communications Commission is a healthy way to keep government workers from getting out of touch with the industry they are trying to encourage and regulate. He sees a lack of this in CAA and hopes to get more "new blood" from the aviation industry into CAA.

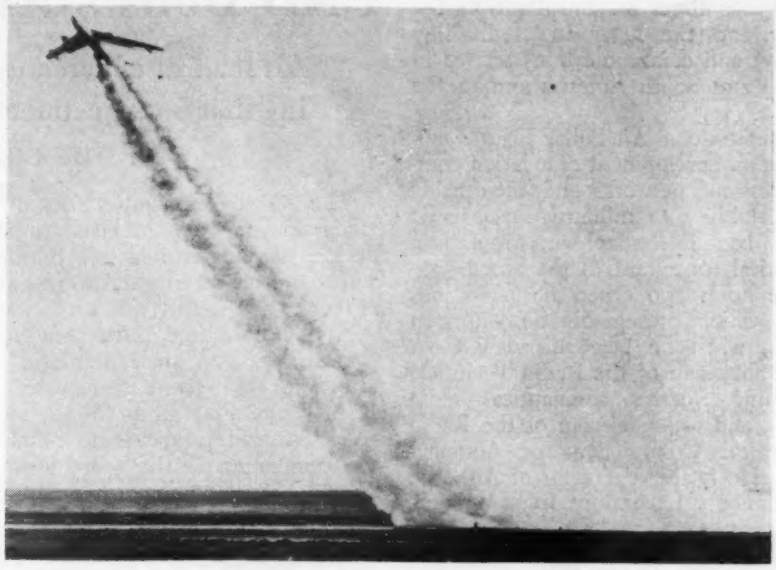
Asked about reports that he had run a "pretty tough show" down in Mexico to get his organization set up there, Rentzel grinned slightly.

"It was a case where there had to be firmness, or the whole show would have fallen apart" he explained. "I don't think I made enemies, and I have a lot of good friends down there. But the Mexico setup was like organizing a complete CAA in Mexico to our airline operating standards. It was something new. Now we are operating it practically as part of the government."

▶ **Rentzel Career** – Rentzel came to Aeronautical Radio in 1943 from American Airlines where he was Director of Communications.

▶ **Pilots License**—Rentzel has held a private pilot's license, is an AOPA member, since 1938, and owns part interest in a Luscombe two-placer which is hangared at Cross Roads Airport, Va., near his home in Park Fairfax, Va., Washington suburb. He thinks there is room for further emphasis on "development" rather than "policing" of private flying in CAA.

During World War II, in addition



UNLIMITED PRODUCTION

Air Force has ordered unlimited production on Boeing's radically designed six jet bomber, the XB-47. Now powered by General Electric TG-180 jets, production models are scheduled to take the G-E TG190-A which will produce better than 6000 lb. static thrust apiece, raising XB-47 total jet power to 36,000 lb. Full take-off power is strikingly demonstrated in these photos showing the XB-47 using 18 Jato built in Jato units that add 18,000 lb. static thrust to the six jet engines. Photos were made during recent flight tests by the USAF at Moses Lake Air Force Base in Washington.

to his airline-sponsored job, he served at various times as consultant to the Army and the Navy in establishing airways and communications service in North and South America and in the Pacific.

Congressional Air Policy Board's emphasis on development of aviation communications networks and their ready convertability to military use may be traced back to Rentzel who was a radio technical consultant to the board.

He holds two other top radio jobs from which presumably he will step down, when he takes his new CAA post: chairman of the Radio Technical Planning Board's aeronautical radio panel, and vice chairman of the Radio Technical Commission for Aeronautics. He is also a director of Airborne Instruments Laboratory Inc.—**A. McS.**

Passenger Rate War Threat Seen by Delta

A passenger rate war, concentrated in the eastern half of the country, may be brewing among the certificated airlines.

Delta Air Lines has pointed to this possibility in a bitter protest to CAB against proposed roundtrip fare cuts which Eastern Air Lines and National Airlines plan to institute May 1. Under the proposed 18-day excursion rates, EAL and NAL would offer roundtrip tickets at 125 percent of the combined one-way normal fares during their slack summer season (AVIATION WEEK, Mar. 29).

The proposed cuts are basically unwise at the present time and should be prohibited, Delta told CAB. "Failure to suspend these tariffs inevitably would precipitate a general rate war throughout the industry which would have a destructive effect on the financial position of all certificated carriers."

Delta said the reductions come with "ill grace" (particularly in the case of National) at this time in view of substantial mail pay increases recently granted both carriers. EAL and NAL currently average 5.7 cents a passenger mile revenue. Net return under the proposed new tariffs, Delta said, is about 3.6 cents a passenger mile—insufficient to cover the costs of operating EAL's DC-3s or NAL's Lockheed Lodestars even at a 100 percent load factor.

VFR Broadened

Civil Aeronautics Board increased Visual Flight Rules minimum altitude from 500 to 1000 ft., VFR night minimum from 1000 to 2000 ft. and Instrument Flight Rules minimum from 1000 to 2000 ft. over mountainous terrain in an amendment to Part 61 of Civil Air Regulations.

CAB Boosts Airlines' Revenue

Air mail rate increases offered by Board with blunt warning that no adjustments will be made for previous losses.

By CHARLES ADAMS

The Civil Aeronautics Board has taken a major step to boost revenues of the nation's five largest trunklines and to bolster them against a repetition of last year's record deficits.

At the same time, CAB bluntly told the carriers that their domestic mail rates prior to 1948 were adequate. The Board contemplates no direct adjustment in mail payments to reimburse the companies for the heavy losses resulting from equipment groundings, strikes or over-expansion in 1946-47.

▶ **Long Term View**—CAB emphasized that its long-term mail rates are set high enough to provide a margin for unforeseeable risks. It said the carriers must shoulder deficits resulting from non-recurring expenses prevailing over a short period of time.

Domestic mail revenue of American Airlines, Eastern Air Lines, Northwest Airlines, TWA and United Air Lines would be boosted an estimated $5,271,000 annually if the carriers accept rate increases now being offered by the Board. The proposed hikes are designed to give the unsubsidized "service rate" carriers mail compensation in line with the sharply higher postwar operating costs and lower load factors.

▶ **Past Deficits**—Under a 45 cents a ton mile domestic mail rate, American had a net deficit of $2,962,000 last year; TWA lost $4,928,000; United lost $3,774,000 and Eastern earned $1,259,000. Northwest, with a 60-cent rate, lost $953,000. CAB pointed out, however, that the 45-cent rate had enabled all five carriers to earn "very high" profits in 1945.

▶ **Rate History**—American, Eastern, TWA and United have been receiving 45 cents a ton mile mail pay since Jan. 1, 1945, when the rate was cut from 60 cents a ton mile. Under the new proposal, American will receive about 62.62 cents a ton mile, Eastern 68.38 cents, TWA 61.45 cents and United 59.70 cents. American's new rate would become effective Apr. 7, 1948, while the others would date back to Jan. 1, 1948.

Northwest, which has had a 60 cents a ton mile domestic mail rate since 1943, would receive 70.9 cents a ton mile retroactive to Jan. 1, 1948.

▶ **Revenue Estimated**—American's new rate would yield about $4,757,000 in mail pay annually, an increase of around $1,338,000. Eastern would get $2,604,000, a gain of $890,000; Northwest $1,647,000, up $253,000; TWA $5,142,000, up $1,376,000; and United $5,743,000, up $1,414,000. Total mail pay to the five carriers under the new rates would be about $19,893,000 annually compared to the current $14,622,000.

▶ **Method of Payment**—United, the largest mail carrier, is expected to average about 26,356 mail ton miles daily. UAL would be paid 75 cents a ton mile on its first 2500 ton miles of mail traffic; 70 cents on the second 2500 ton miles; 65 cents on the block between 5001 and 10,000 ton miles; 60 cents on the block between 10,001 and 15,000 ton miles; 55 cents on the block between 15,001 and 20,000; 50 cents on the block between 20,001 and 25,000; and 45 cents on its remaining 1356 daily ton miles. The 45-cent rate is effective on the block between 25,001 and 30,000 ton miles daily, and a 40-cent rate on 30,001 ton miles daily and over.

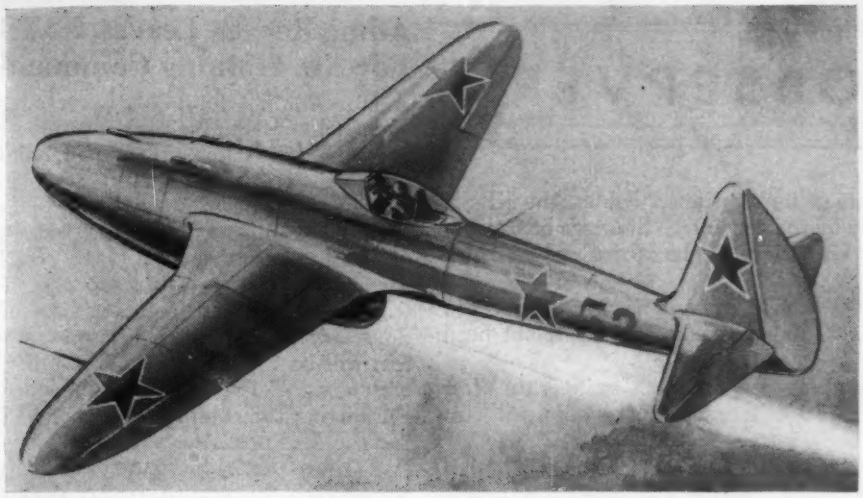
Northwest, which has the smallest mail loads of the five major trunklines, is expected to average about 6364 ton miles daily. NWA would, therefore, fly its first 2500 mail ton miles at a 75-cent rate, its second 2500 ton miles at a 70-cent rate, and its remaining 1364 ton miles at a 65-cent rate.

▶ **Overall Differential**—Since Northwest would fly no mail at less than a 65-cent rate—while United would handle part of its traffic for as little as 45 cents a ton mile—NWA's overall rate (70.9 cents) is considerably higher than UAL's overall rate (59.7 cents). TWA's daily mail ton mileage is expected to average 22,926, American's 20,814 and Eastern's 10,433.

At least one and possibly three of the five carriers are expected to oppose the proposed new rates. TWA Board Chairman Warren Lee Pierson already has protested the apparent reluctance of CAB to recognize the air transport industry's serious financial problems.

▶ **Losses Cited**—Pierson said the denial of higher mail pay for the period prior to Jan. 1 was disappointing in view of the losses suffered by the airlines since the war. He expressed hope that CAB, upon reconsideration, would give "fair treatment" to the carriers.

▶ **Other Protests**—United and Northwest also may attack their proposed new mail rates as inadequate. UAL last November asked for $2.26 a ton mile for calendar 1947 and $1.25 after Jan. 1, 1948. NWA last December requested additional mail pay retroactive to Nov. 1, 1946, and a rate of at least $1.54 a ton mile beginning Jan. 1, 1948.



Artist's Sketch of YAK, Russian Jet fighter. (Drawings Courtesy the Aeroplane Spotter)

Russian Jet Fighters Operational

Details uncovered on YAK and twin-engine MIG point toward well-designed aircraft of good performance.

By FREDERICK R. BREWSTER

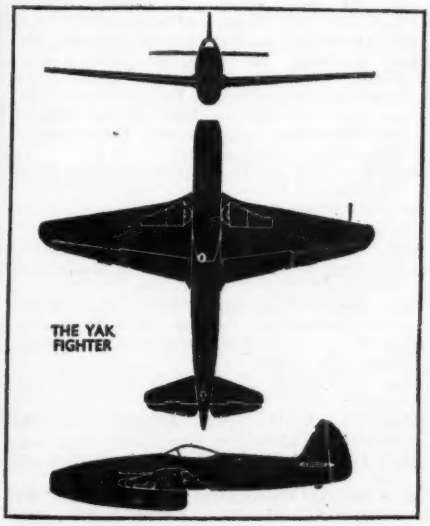
(McGraw-Hill World News)

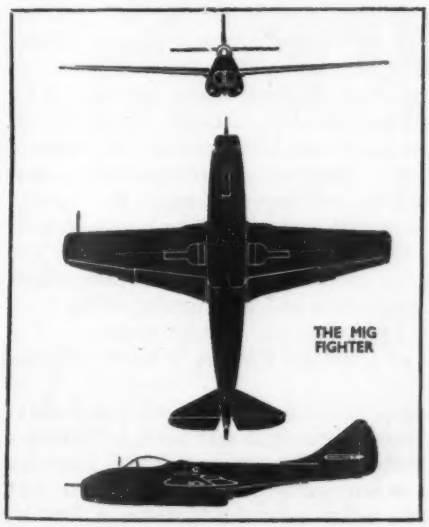
LONDON—Russia has fast, modern jet fighters in full, operational squadron service. Less publicized is the fact that the Russian Air Force used jet fighters in World War II. Twice Hero of the Soviet Union, Lieut. Gen. Savitski fought a number of battles against Germans over Berlin in a jet fighter.

Details of two of the most important Soviet front-line single-seat jet fighters, the MIG and the YAK, recently were given in "The Aeroplane Spotter." How many are being built and what jet fighter force the Soviet Union has at its disposal has yet to be disclosed. However, it is known that about 100 jet fighters, a "mixed bag", took part in the Moscow 1947 May Day (May 1) celebrations.

► **The MIG**—When first illustrated, the MIG twin-jet single-seat fighter was thought to be the conception of fighter-designer Sergei A. Lavochkin. Later reports prove it to be the work of Artem I. Mikoyan and Mikhail I. Gurevich (MIG) who were responsible for the series of mixed wood-and-metal construction single-seat fighters, the MIG-1, -3 and -5.

Close study of the MIG silhouette will reveal a similarity in fuselage design (at triangular cross-section) to the German Messerschmitt Me 262A Stürmvogel (Storm Bird). Most interesting point of all is the parallel arrangement of the axial-flow tubojets under the forward part of the fuselage. This positioning has resulted in an interesting combination of a "step-up" in the underside of the fuselage and a "hull-like" cross-section to the rear fuselage which, aided by a short keel, divides the gases forced out by the parallel units.





► **Big Plane**—With a span of 42 ft. 0 in. and length of 38 ft. 0 in. the MIG jet is a large single-seat fighter (larger than the Gloster Meteor). Careful designing has placed the cockpit forward of the wing leading-edge, and combined with a sloping-down nose and straight-backed rear fuselage.

It uses tricycle landing gear, the nosewheel retracting backwards and upwards to fit snugly between the divided nose air intakes. Armament, fitted in the nose, consists of two heavy-calibre machine-guns, one each side and below the air intakes, and a heavy-bore cannon, centrally positioned.

Although no performance figures are available, the MIG is obviously fast, in the 600 mph. class, and has all the making of a general-purpose jet fighter.

► **The YAK**—Youngest top-line aircraft designer in the U.S.S.R., Alexander S. Yakovlev has designed light, sporting and transport aircraft, but in the main has concentrated on single-seat interceptor and reconnaissance fighters. From external appearances it appears that the YAK jet is probably the oldest operational jet fighter of the Russians.

One of the smallest and most compact single-seat jet fighters in the world, the YAK has an estimated span of 33 ft. and length of 30 ft. Externally, the YAK-jet appears to be a modification of the standard YAK-3 and -9 piston-motor fighters of World War II. Unlike the MIG-jet, the YAK has only one axial-flow turbojet; also it provides poor all-round view for the pilot, the cockpit being situated well back and over the trailing-edge of the wing which, combined with tailwheel-type undercarriage, restricts visibility when taxiing.

Armament, possibly consisting of two heavy-calibre machine-guns and one heavy bore cannon, is situated in the top half of the nose just forward of the cockpit. Wing pattern is reminiscent of the standard YAK-3 and YAK-9.

► **Construction**—Unlike the MIG-jet, which is believed to be of metal construction, the YAK-jet is probably a combination of wood and metal, as was the YAK-3 and YAK-9. A deep rear fuselage eliminates the necessity for a dorsal fin fairing, while the tail assembly shows no striking departure from previous practice. In fact, the fin and rudder is typically Yakoblev, presenting a "slope" appearance.

The tail wheel protrudes slightly, no doubt as a safety precaution in case the retracting mechanism fails to operate when the pilot is landing. Like the MIG, the YAK-jet is in full squadron service.

INDUSTRY OBSERVER

► **McDonnell Aircraft will make initial tests of its parasite jet fighter, the XP-85, with a Boeing B-29 assigned to the company by the Air Force. Shortage of Convair B-36A's caused the substitution. The XP-85 is designed to be carried and launched from the B-36A bomb bay.**

► Consolidated Vultee is negotiating a new loan agreement with a group of 13 banks that previously provided a $25,000,000 line of credit which has not been used in full.

► **Navy will assign bulk of its new Lockheed TO-1 tandem jet trainers to West Coast Navy and Marine squadrons. Total of 50 jet trainers now on order will cost $5,000,000.**

► Air Force has not yet accepted a single Boeing B-50 bomber although 42 completed planes are on the Boeing flight line at Seattle. Reasons are minor mechanical troubles and omission of government furnished equipment on which Boeing has been unable to obtain delivery. One of the key missing items is armament and electronic fire control.

► **Boeing has experienced a big demand for its lightweight gas turbine engine, produced purely on an experimental basis. Navy is buying two for experiments on amphibian Ducks. Split cycle in which turbine and power drive are on separate shafts may solve the problem of the Duck stalling on the beach during transition from water to land travel. Navy is also investigating the Boeing engine as a starting unit for the Westinghouse 24D jet engine which requires hot air for starting. Navy is trying to get Boeing to turn the engine over to Continental Motors for production.**

► Canadian Navy will use Hawker Sea Fury X fighters aboard its new carrier the Magnificent; due in Canadian waters early this summer. Pilots for the carrier group are now being trained in Northern Ireland on the new fighters which have a top speed of 460 mph. and a 5000 fpm. rate of climb. Range is 2080 miles.

► **Convair's B-36A flew better than 6000 miles in its recent 30-hour test flight from Fort Worth. Convair officials said it was the longest flight with heaviest load thus far attempted in the test program. Crew of 11 aboard, included Convair and Air Force personnel. Air Force now rates B-36A range at 8000 miles instead of the 10,000 miles formerly publicized. Current endurance record without refueling stands at 84 hr. 32 min. set in 1932 by Walter Lees and E. A. Brossi in a Packard diesel-powered Bellanca monoplane.**

► Argentina has ordered 50 de Havilland Dove twin-engine light transports at a cost of about $8,000,000. This order follows an earlier contract for 20 of the type, which are now in service. The Dove carries 11 passengers and pilot and is powered by two 345 hp. DH Gipsy Queen air-cooled engines. It cruises at 200 mph. over a range of 1150 miles. Some of the craft will be specially equipped to combat locust plagues.

► **Although many other reasons are being offered for the recent Delta DC-4 crash on the edge of Chicago Municipal airport, on-the-spot technical observers are convinced it was another case of a take off made with the gust lock on, similar to the United DC-4 crash off the runway at LaGuardia Field, N. Y., last summer.**

► All-American Aircraft, Inc., is awaiting confirmation of a letter of credit to activate an order from Argentina for 100 of its Ensign personal planes. Order calls for delivery over a period of 18 months, but negotiations are under way to complete deliveries within the nine months of an original export license. AAA now is fully tooled for production at Long Beach, Calif. Officials say the South American order will permit start of work on an accumulated number of domestic orders. To date, six Ensigns have been built. Two have been delivered to customers, two are NX demonstrators and on tour, and two still are at the factory.

► **Pacific Airmotive Corp. has an engine overhaul and inspection contract with Chinese Air Force and Maj. Gen. Claire L. Chennault's Civil Air Transport. The latter is shipping 42 R-2800 engines for major overhaul to PAC's Burbank plant, while Chinese Air Force has contracted for inspection and test running of Packard-built Rolls-Royce Merlins and overhaul of Lycoming and Ranger engines. The company has sold a "considerable number" of converted Pratt & Whitney engines to Chinese Air Force.**

► First jet-propelled airline, a Vickers Viking powered by two Rolls-Royce Nene's, has been test flown in England. Vicker-Armstrong's chief test pilot J. Sommers flew the jet Viking for 20 minutes. Modification of the standard Bristol Hercules powered Viking to take jets is strictly an experimental project designed to test both twin-jet power supply and the transport's airframe for the Ministry of Supply.

Adm. Reeves Leaves NATS For Air Training Command

Rear Admiral John W. Reeves, Jr., commander of the Naval Air Transport Service since March, 1945, will relinquish his post around Apr. 30. He will take over new duties on June 1 as Chief of Naval Air Training, with headquarters at the Pensacola, Fla., Naval Air Station.

Relieving Admiral Reeves as head of the Navy's reduced air transport system will be Capt. Marshall B. Gurney, presently NATS deputy commander. In ordering the consolidation of NATS and the Air Force's Air Transport Command into the Military Air Transport Service early this year (AVIATION WEEK, Feb. 9), the Secretary of Defense authorized retention by the Navy of only such air transport as is required at places and on routes not served by the newly-organized MATS.

Admiral Reeves, in his new assignment, will exercise direct control over four sub-commands: Basic Air Training, Pensacola; Advanced Air Training, Jacksonville, Fla., and Corpus Christi, Tex.; Naval Air Technical Training, Memphis, Tenn.; and Naval Air Reserve Training, Glenview, Ill. The Admiral's former headquarters at Moffett Field, Cal., probably will remain under Navy control as the major base for the Navy's remaining air transport operations and as a training field for carrier air groups.

AVIATION CALENDAR

Apr. 20—ICAO rules of the air and air traffic control division, Montreal.
Apr. 20-21—Second Annual Third-Regional Aviation Conference, Minneapolis Auditorium.
Apr. 22-23—AIA personal aircraft council meeting, Dallas.
Apr. 22-24—Fourth annual forum, American Helicopter Society, Philadelphia.
Apr. 22-24—Aviation and Airport Management Conference, Minneapolis.
Apr. 24—Dedication of "Wright Way" (Skyway 1), Municipal Airport, Dayton.
Apr. 27—ICAO facilitation division, Europe.
Apr. 27-May 26—American University's Second Annual Foreign Transportation Institute, Washington, D. C.
Apr. 28-30—American Institute of Electrical Engineers, northeastern district meeting, New Haven, Conn.
May 4—ICAO North-Atlantic regional meeting, Paris.
May 4—ICAO European-Mediterranean Regional Meeting, Paris.
May 5-6—Air Transportation Education Conference, Purdue University, Lafayette, Ind.
May 12-15—Aviation Writers Association, 10th Annual Convention, New York City.
May 16—Annual Cotton Carnival Air Show, Memphis, Tenn.
May 17—ICAO facilitation division, Geneva.
May 17—ICAO North Atlantic Regional Meeting, Paris.
May 18-20—AIA board of governors meeting, Williamsburgh, Va.
May 19—Air Commerce Day at Miami, part of World Trade Week observance.

LETTERS

Navy's Carrier Jets

To The Editor:

Enclosed you will find the background release distributed to the press on the occasion of the first carrier landings by pilots of a squadron equipped with Navy jet fighters. I hope that this will clear up the misunderstanding which apparently was in your mind when you printed the blocked-in paragraph entitled "The Scoop That Wasn't" on page 7 of the March 22 issue of AVIATION WEEK. It is fact that all hands were informed of the nature of the operation and that other jets, both British and Navy, had made carrier landings and take-offs.

If further confirmation is necessary, on page 13 of the same issue of your magazine, Scholer Bangs, in the first paragraph of an excellent article on the same operation, includes the historical items which your page 7 paragraph criticized the Navy for having omitted.

As to having established the practicality of jet operations from a carrier, I wish to state that no such claim was made by the Navy. It took years to perfect the carrier operation of conventional aircraft. That knowledge so gained is making the operation of jets easier. The Navy, as a result of the previous jet aircraft flights from carriers, and the advances made in design of both power plants and aircraft, is now in the position of being able to increase its operating experience with jets as fast as they become available.

I wish to emphasize that this office neither intentionally issues nor permits to be issued any information concerning the Navy that is not factually correct.

L. C. SIMPLER, Capt., U.S.N.
Assistant Director for Aviation
Office of Public Relations
Department of the Navy
Washington, D. C.

To The Editor:

I'm completely at a loss to understand the unwarranted criticism from the aviation trade press, especially that expressed in AVIATION WEEK of March 22, over the publicity given the recent carrier trials of the Navy FJ-1 Fury.

I say unwarranted, because the criticism would not have developed if the writers had taken the trouble to do what is first drilled into a cub reporter—get the facts.

The press aboard the Boxer for the FJ-1 trials was informed that these were the first OPERATIONAL carrier landings and takeoffs. They were also told that jet landings and takeoffs had been made previously by the P-80 and FH-1.

This information was imparted on the eve of the trials and upon their completion. The sources were Lt. Comdr. E. M. Jacoby, Navy Area P10, Los Angeles; Comdr. W. A. Sherrill, BAR representative at North American Aviation, and Comdr. E. P. Aurand, skipper of Fighting Squadron FIVE Able. Commander Aurand also pointed out that the British had previously made jet landings and takeoffs.

The astonishing part of the box carried by AVIATION WEEK is that it tied into a story by Scholer Bangs, your West Coast editor, in which these facts were reported. If the home office had checked back with Scholer before writing the box, it would have found that the Navy did not misrepresent the situation.

While it is true that part of the press reported these were the first carrier jet landings and takeoffs, it was not because the Navy made any such claim for them. It was pointed out that FIVE Able on the West Coast and Fighting Squadron SEVENTEEN Able on the east coast were starting the Navy's jet program, and that expansion of this program would be carried out with different planes than those now in use. The Navy further pointed out the disadvantages in jet operations and said conventional planes could still best perform some operations.

It seems to me that the Navy was extremely forthright in presenting the entire affair. There was no handout for the operation itself. The press obtained its story through a pre-trial press conference and question-answer period with Navy and North American enginers; observation of the trials, and a press conference and question-answer period with the pilots. FIVE Able was the first operational jet squadron because it beat SEVENTEEN Able aboard a carrier, although the east coast group was activated with FH-1's before the west coast group got its FJ-1's.

There was no pretense that the Navy now has or is getting a lot of jets. Vice Admiral George D. Murray, commander of the First Task Fleet, told the press, "We now have the problem of development to make jet aircraft practical for carrier operations." Nothing that was said or done aboard the Boxer constituted the type of thing criticized by the Finletter Commission's report.

Other statements in your magazine's criticism are based upon assumptions and suppositions which will be answered by future developments. Your bland assertion that "many inaccuracies" emanated from the Boxer is unfounded and untrue, which you can easily verify with your own staff representative. It seems to me AVIATION WEEK owes the Navy an apology.

EDWARD J. RYAN
Director of Press Relations
North American Aviation, Inc.
Los Angeles 45, Calif.

Britisher & Autopilot

To The Editor:

My attention has been drawn to a short article in your edition of Dec. 8, 1947, in which, under the title "British Autopilot Claims More Reliability," a brief description of the Smith S.E.P.1. is given together with a paragraph of comments in which it is suggested that the design is several years behind advanced American design, particularly in the use of three gyros, "whereas the American device utilizes a single gyro, universally mounted to be sensitive to movements of the plane around three axes."

I hope that you will permit me, as the designer of the S.E.P.1., to reply to this adverse comment.

May I say at once that the general description in your article is quite fair and accurate except for a minor slip in which the backing off signal is referred to as "proportional to the rate of turn of the aircraft" instead of "proportional to the rate of application of the relevant control"?

I submit that it is quite inaccurate to suggest that any modern American autopilot of comparable performance and flexibility uses only one gyro. The Pioneer PB.10 uses three gyros and the Sperry A.12 two. I am well aware that control can be effected by a single gyro but quite clearly such a control is insensitive to deviation of the aeroplane about the rotor axis and this necessarily results in less satisfactory control. Perhaps the first autopilot to adopt this solution successfully was the British Mk. VIII which was based on my patents and extensively used in World War II. In this case, by selecting an inclined axis in the plane of symmetry for the insensitive axis, the ailerons, which controlled the steering as well as the banking, responded to either yaw or roll.

Whatever criticism may be levelled at the design of S.E.P.1, it must be admitted that it is a radical departure from conventional practice. In fact, prior to its successful performance in service trials, those most competent to criticise were distinctly apprehensive on the score that it contained so many unproved features. To suggest, therefore, that the design is archaic is, to put it mildly, naive.

F. W. MEREDITH
Research Department
S. Smith & Sons (England) Ltd.
Bishops Cleeve, England

Contribution To Safety

To the Editor:

As a 3000 hour pilot, former Army primary instructor, and now a Luscombe owner and pilot, I think your reprint of the Beech Bonanza accident report March 22 is one of the great contributions to safety in personal plane flying.

Certainly Beech is to be commended for such a thorough report and possibly aviation publications can help to spur other manufacturers into similar accident reports.

Accidents from carelessness make it tough on all of us in the eyes of the non-flying, yet-to-be-convinced public. But spreading of such information that plane accidents—as well as auto accidents—are sometimes caused by foolhardiness will help to lessen their bad effect on the uninformed public.

Couldn't you report all Beech accident reports?

MAX BURK
Commercial Photographer
Manhattan, Kansas

ENGINEERING & PRODUCTION

Monthly Reports: System Changing

January shipment figures show drop in civil business but give no over-all data due to new reporting method.

By WILLIAM KROGER

Keeping track of manufacturers' sales progress—always more difficult in aviation than in most industries—is likely to get more complicated. Bureau of Census is omitting value of payments to military contractors in its monthly aircraft shipment reports and in the future probably will report these payments only at three-month intervals.

Result is that first report under the new arrangement—for January—shows a sizeable drop in civil and military business for that month, but gives no indication whether the manufacturing industry started the new year at, above or below the pace of a year ago.

▶ **Weakness of Reports**—This change in the reporting method is only the first noticeable one of many that are expected to follow. For some time there has been dissatisfaction with the monthly reports as not giving precise data on the activities of a particular month's operation.

This first change—reporting military payments quarterly—was influenced by the fact that these payments are for all military services performed and bear no relation to deliveries of aircraft in that month. While the figures did indicate total monthly income of the manufacturers, they furnished no guide to revenue from acceptances of military aircraft.

▶ **January Results**—The new reporting system actually gives only an index to civil and commercial income for airframe manufacturers in January. Total revenue from sale of civil aircraft, parts and other products amounted to $9,326,677, compared to $10,561,806 in December and $14,765,173 in January, 1947.

Revenue from personal-type planes in January of this year was $2,055,755, and from transport planes, $2,498,533—both slightly below December results.

Number of planes shipped each month has been retained in the new report. For January, 1948, total shipments were 607, as against December's 790. January break-down was: 136 military planes (288 in December), 13 transports (15 in December) and 458 personal (487 in December). Two-place planes shipped in January numbered 229, and four-place 216. This is the first time in many months that four-place sales trailed two-place shipments.

▶ **Engine Report** – While eliminating military payments to airframe manufacturers, the January report continues listing all military payments to engine manufacturers, regardless of whether they cover accepted engines.

Total payments to engine manufacturers for all produced in January were $23,675,922, against $29,972,550 in December. By far the bulk of the January engine income ($18,885,879) represented payments on military orders. Military engine backlog at the end of the month (payments expected in the following six months) was $143,195,196.

SAE WINNER

Henry Bendel Gibbons, chief of structures for Chance Vought Aircraft division, United Aircraft Corp., received the 1947 SAE Wright Brothers Award for his technical paper on "Experiences of an Aircraft Manufacturer with Sandwich Material." While at Goodyear Zeppelin Corp., he participated in the design, building, and flight testing of the dirigibles Macon and Akron, using the metal-faced sandwich material in the flooring and walkways of the latter. An M.I.T. graduate, he joined Chance Vought in 1939.

▶ **Other Changes in Offing**—Bureau of Census and industry statisticians are studying other changes in the method of reporting monthly aircraft manufacturing figures. For a long time it has been the concensus that little meaning could be attached to the backlog figures—possibly excepting those of military contractors who reported payments expected within six months.

Now it is expected that backlogs, too, will be reported only quarterly. This might also be done for employment. (January employment in airframe plants was 148,990, in engine plants, 32,921—both continuing a rise that began in October.)

The reporting methods has been tinkered with almost continuously since the end of the war, the last major change being last year. At that time, types of military aircraft, by number, were eliminated, and the system of listing military payments expected within six months was begun by the reporting agencies.

Martin Trend Toward UAW

Bargaining rights still remain unsettled at Glenn L. Martin Co.'s plant at Middle River, Md., but CIO's United Automobile Workers has inched closer toward formal retention of its bargaining status.

UAW-CIO picked up 318 more votes last week when the National Labor Relations Board opened 450 challenged ballots, giving the CIO union a total of 3047. The rival International Association of Machinists got 64 of the challenged ballots, making its total 1980. The remaining ballots went against both unions, giving the "no union" group a total of 1033.

Whether the UAW-CIO has a clear majority will depend on what NLRB does about 88 remaining challenged ballots. It withheld decision on these pending the outcome of the challenged ballots already counted. If they are all to be counted, UAW-CIO will need 28 votes to garner a majority of 3075. If none are to be counted, the UAW-CIO's 3047 will constitute the necessary majority. If, in the end, it does not obtain a majority, a run-off between the two unions will be necessary. The election was held Aug. 21.

Republic Loss

Republic Aviation Corp. reported a net loss of $2,079,585 for the year ending Dec. 31, 1947 on sales totaling $38,280,857.

Loss sustained on the Seabee project was $6,700,000 of which $4,700,000 was incurred through liquidation of project and $2,000,000 on plane sales.

Company's backlog as of Feb. 2, 1948 amounted to $57,000,000.

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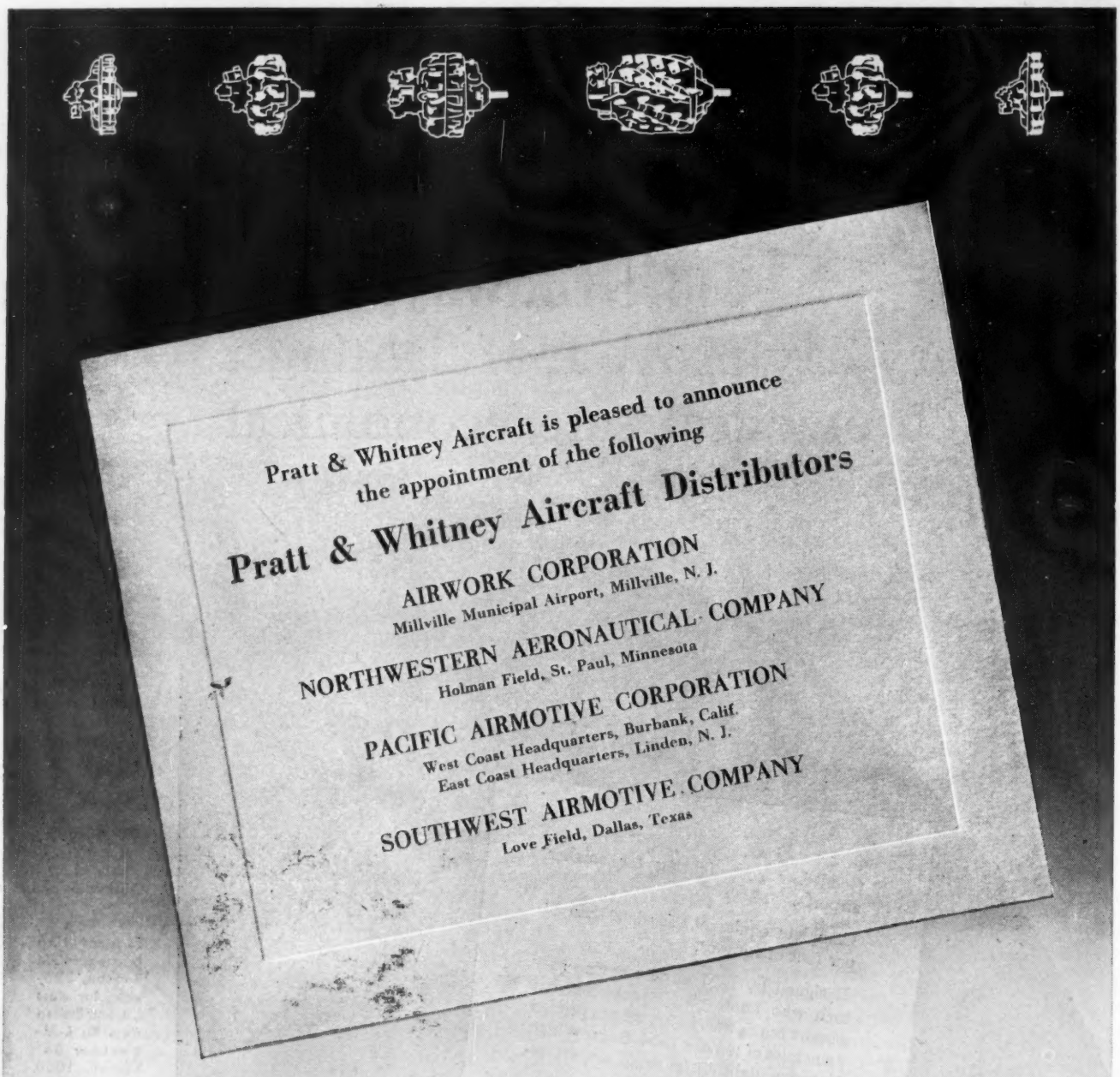
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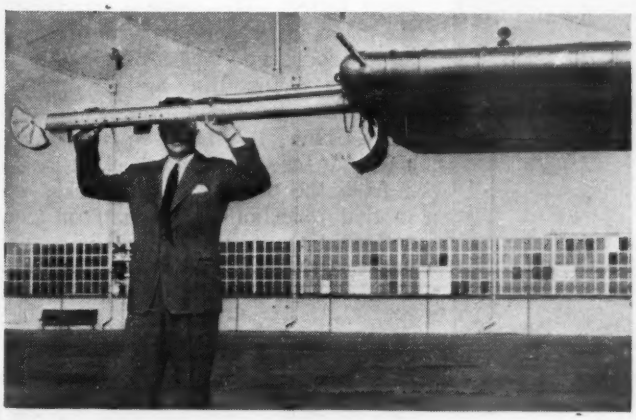
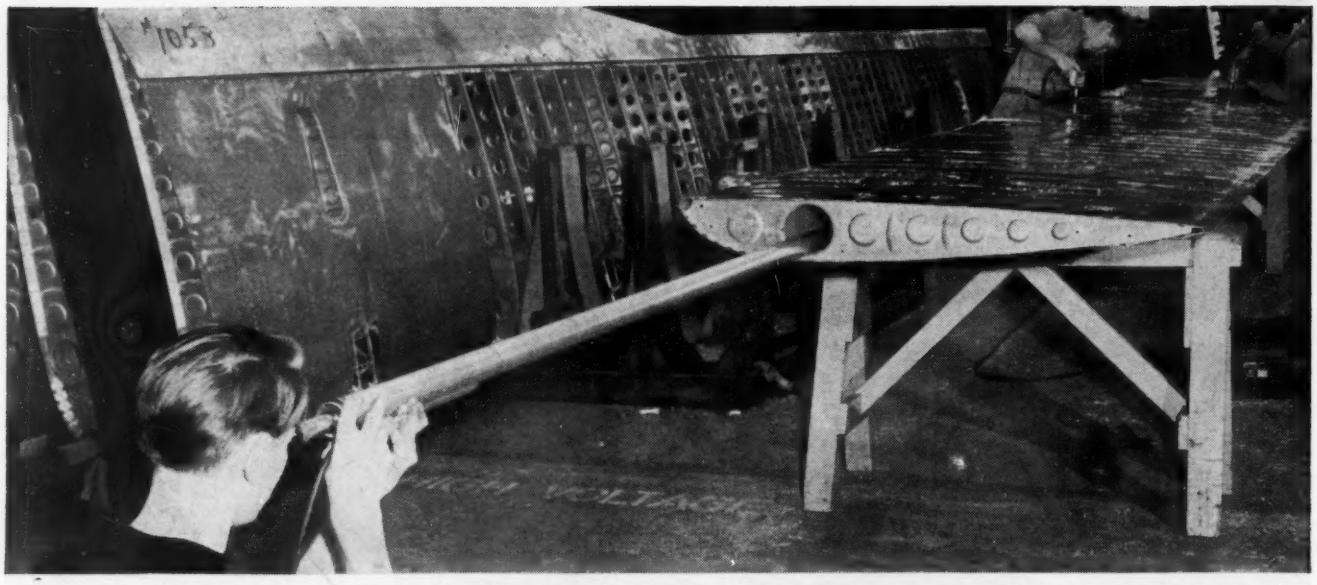
NEW AIRCRAFT

Close-up of Convair Car

Consolidated Vultee Aircraft Corp. once again is flying its Convair Car, after the first one crashed when it ran out of fuel. Shown here—in the first detailed photos ever published—is the number three car attached to the original flight section. Above is a rare view high in the air with the 190 hp. Lycoming engine turning a three-blade Sensenich propeller. Right is one of the most novel sections of the Convair Car: the pilot or driver seat. Automobile and flight controls are separate, the latter on a control stick swung down from above. Note dash with its blending of auto and plane instruments. Car is driven by a rear-mounted 26½ hp. Crosley motor. Below, left, jacks for the flight section are carried span-wise in the 34½ ft. wing, are pulled out when flight section is to be removed. Below, right, the four-lb. jacks—one under each wing and one that slides down from vertical tail section—lift flight component off, permitting car to be driven away under its own power. Baggage is carried under the car's hood. (Photos by Ross-Pix)





This 15-ft. scope, utilizing mirrors at far end, is employed at Boeing plant to inspect rivets inside of wing flap tube.

Mirrors Simplify Precision Work

Boeing develops ingenious uses for reflectors in a wide variety of production jobs and in research work.

Mirrors are proving to be valuable production and research tools at Boeing Airplane Co.

Applications have been found in aligning of guns and harmonizing of turrets on the B-50, in inspection and quality control phases, and for shock wave observation in ramjet studies.

▶ **Gun Alignment**—In aligning, or bore-sighting, a one- by two-foot perfect mirror, on its stand, is set at a distance of about ten yards from the gun muzzles, before the turrets are installed on the airplane. An ordinary rifle sighting scope attached to an adapter is inserted into the gun bore, forming a continuation of the bore axis. Over the front of the scope is fastened a small target form, facing toward the mirror, its bulls-eye cut away to form the scope's forward opening.

Looking down into the scope, through an eye-piece on its upper side, the mechanic sees the reflection of the bulls-eye in the glass. He adjusts the gun until the cross-hairs of the scope fall exactly on the center of the target's reflection—when he is, in effect, looking his mirrored reflection directly in the eye. The gun bore axis then forms a true 90-deg. angle with the mirror, and an exact parallel to the line of sight.

▶ **Harmonizing Procedure**—After each of the three or four guns in a turret has been similarly adjusted and the turrets installed in the plane, the guns are put through another optical check, known as harmonizing. This process sets up the central fire-control system of the B-50 so that, electrically, it parallels the mechanical system already established in each individual turret through bore-sighting.

The harmonizing routine is almost a duplicate of the bore-sighting procedure but, instead of utilizing a single looking-glass, makes use of seven, known collectively as a "mirror range."

A length of pipe, almost as long as the 98-ft. B-50, is mounted permanently about 12 ft. above the factory floor. Four of the mirrors are attached to the horizontal pipe while the others are attached to pipes suspended from the framework for use in harmonizing the lower turrets. The range is parallel to the plane, just beyond its wing-tips, and located between two adjoining assembly bays so the firing systems of two planes can be harmonized simultaneously. Thus, this arrangement utilizes a double set of mirrors, back to back.

After the plane had been jacked up so that reflections of its gun muzzles and sighting stations will fall upon the proper mirrors, all guns are lined up with their bore axes perpendicular to their respective mirrors, by using the combination of sighting scope and target. The plane's sighting stations then are lined up so their lines of sight are

Here, hand image on mirror demonstrates how shadows of shock waves can be observed by aerodynamicist conducting ramjet study when jet stream strikes obstacle in its path.

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Boeing foreman (left) uses scope and target to set guns perpendicular to "mirror range" reflectors (right) in turret harmonizing procedure. Range structure is set between assembly bays to allow simultaneous adjustment on two craft, thus speeding work.

also perpendicular to the mirrors, and the stations and turrets are then electrically "tied together" so they will operate in harmony.

This novel production-line use of mirrors, devised by Boeing employees John Christian and Robert T. Seymour, is claimed to be a saver of both time and money. If this method were not employed, planes would have to be taken into the open and their guns harmonized on some distant object. And when weather and visibility conditions complicate the procedure, the outdoor method loses much of its accuracy.

▶ **Shock Wave Observation**—The shadowgraph, designed to observe shock waves in ramjet research, consists of a series of mirrors in a set-up created primarily for Schlieren photography in that the light source is used basically for the Schlieren system. The use of mirrors allows operation of Schlieren and shadowgraph systems from this one light source.

Studies can be made by sending parallel rays of 5000-cp. light, from a lens, across the supersonic stream of the jet. Differences in density of the stream cause the light rays to be deflected from their normal path, making it possible to photograph them—or to throw their shadows on a ground-glass screen for observation.

The first mirror, 2¾ × 1¾ in., is placed beneath a tiny 1000w. light bulb, reflecting its rays to a second mirror mounted at a 45-deg. angle directly under the jet stream. From this second surface, the light travels up through the stream, picking up the shadows of the shock waves and throwing them upon a sandblasted Plexiglas screen above the stream. A third mirror reflects the shadow image from the screen to a fourth reflector, five feet off the floor. This reflector can be seen by watchers through the window of the observation cell, nearby, and they can calculate the velocity and direction of the jet stream by the angle of shock.

▶ **Inspection Applications**—Mirrors also are used at Boeing by riveters, erectors, inspectors, and quality control personnel in various checking procedures.

Majority of riveters carry a small glass to check the forming of rivet heads back of stringers and brackets. Other aircraftsmen use mirrors to insure that nuts fit snugly on bolts, to check the reverse side of material in which they are drilling, and for numerous other jobs.

Inspector uses mirror and flashlight to check rivet formation in inaccessible location.

Nearly every inspector carries a mirror, some preferring a dental-type reflector, others an ordinary rectangular pocket glass. Some of these reflectors are mounted on an extension handle equipped with ball-and-socket joint for angular adjustment.

Frequently, a flashlight is used as complementary equipment. The mirror transmits the ray of the flash to the spot the inspector wishes to observe and sends back to him a reflection of the lighted point. Inspectors use this combination to examine thousands of blind spots in the structure.

Another ingenious gadget is a 15-ft. pipe-like 'scope, designed by Boeing inspectors to study rivet formation inside wing spar structures and on the interior of flap tubes.

There are holes in the top of the 'scope near the far end, and a mirror and light mounted beneath them, within the tube. The light rays, shining up through the holes, illuminate the rivets so their reflection can be picked up by the mirror. At the tube's other end is a rifle scope, so inspectors can look through the tube and get, via the mirror, a clear picture of the rivets.

One of the comparators used by the quality department employs three mirrors for measuring and checking the accuracy of small tools and parts. Two of these mirrors bend the light beam from a 50-cp. bulb while the third, a nine-inch-mirror, reflects the light onto a ground-glass screen, throwing into sharp relief the silhouette of the article being checked. The shadow may be magnified so that ½-in. on the screen represents a dimension of 1/1000 on the actual part.

Controlling Temperature in Jet Aircraft

Cabin cooling and heating must keep pace with higher speeds that bring higher loads.

By D. O. MOELLER, *Chief Engineer*, and O. A. SANNE,
*Project Engineer, Stratos Corporation**

One important design problem now receiving accented attention in high speed jet craft is cabin temperature control.

The increasing speeds of military aircraft require that planning and development of cooling equipment keep abreast with new requirements. Higher speeds with correspondingly higher cooling loads should be parallel developments.

Flight at speeds over the 600-mph. mark under extreme temperature conditions requires some means of refrigeration to make cabin temperatures tolerable for crew members.

▶ **Loads**–Total refrigeration load results from several factors. However, the cooling problem becomes critical because of rise in air temperature with airplane speed. While a small percentage of the heat rise is dissipated to the airstream or lost by radiation or convection, most of the ram temperature rise is effective on the plane's cabin wall and canopy. Air cannot be taken from the airstream for cabin ventilation either, because this air will be at a temperature equal to ambient plus 100 percent of the ram temperature rise.

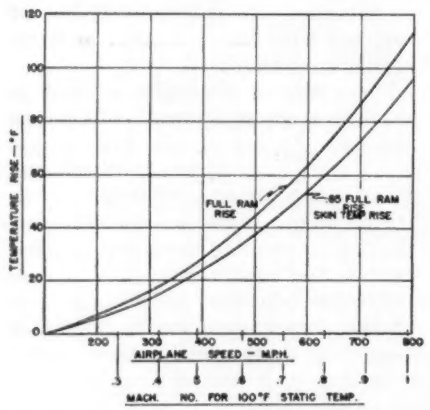

Fig. 1. Effect of speed on air temperature.

An indication of what this rise will be is shown in Fig. 1. On Army Summer Day at sea level, the temperature will be 100 deg. F. plus the ram temperature rise. Experience has shown that for the fuselage portion where the cabin is generally located, temperature is about 85 percent of the full ram temperature rise.

▶ **Inside Heat**–There is additional heat input from electrical equipment, crew members, and solar radiation. Hence, even at high altitudes, a cooling system is required.

In a jet plane equipped with an expansion-turbine type cabin cooling system, the air bleed from the engine compressor is the source of ventilation air, and this air may also be utilized for heating, thereby eliminating the need for a cabin heater. When heating is required, a mixing valve controls the cabin temperature by bypassing varying amounts of hot bleed-air past the cooling unit.

▶ **Cooling Equipment Factors**–There are several factors which influence the size and type of cooling equipment for a given plane–speed; aircraft and cabin size; compressor bleed pressure and temperature available; cabin pressurization requirements; and maximum duration of flight during critical operation, or any specific cooling condition. Tolerance limits at different cabin temperatures and pressures vary with duration of flight.

▶ **Systems Used**–Air cycle systems have been developed and tried in present day jet-aircraft, which appear to meet requirements. These systems are the simple system and the so-called "bootstrap" system.

▶ **Simple**–Basically, the simple system consists of a heat exchanger, expansion turbine, and cooling air fan. Jet-engine bleed air is cooled by passing through the heat exchanger, which uses air at ram temperature as the cooling medium, and is cooled again by expansion through the turbine.

The air is then discharged from the turbine into the cabin at cabin pressure. A cooling air fan is used to draw air through the heat exchanger, and to absorb the turbine power.

▶ **Bootstrap**–The bootstrap system utilizes two heat exchangers combined with a centrifugal compressor and an expansion turbine. Jet-engine bleed air is passed through the first heat exchanger, then goes to the centrifugal compressor and brought to an appreciably higher pressure. The air is cooled in the second exchanger, is finally cooled by expansion in the turbine, and ducted to the cabin.

Power derived from the turbine is used to drive the compressor, and this additional pressure boost gives rise to the "bootstrap" designation. Cooling medium for the exchangers is ram air. Although choice of cooling system is based primarily on its cooling and pressurizing performance, other items such as size, weight (including ducting), drag, and installation details must also be considered.

▶ **Cooling at Altitude**–Though emphasis has been placed on the need for a cooling system at sea level high speed, it is interesting to note that considerable cooling air is required even at altitudes up to 30,000 ft. Fig. 2 shows that the cooling unit is run at a high capacity at altitude, even when there is no cooling load, and heating is required. This is because it is necessary to cool down the engine bleed air by mixing to the temperature which satisfies cabin thermal requirements.

The question might arise, why not cut down the airflow in order to use this higher temperature air for heating? This can't be done, because the airflow is required to maintain cabin pressurization; hence, this compromise is the result.

To illustrate the various factors to be considered, a 600-mph. jet fighter is assumed as the subject craft.

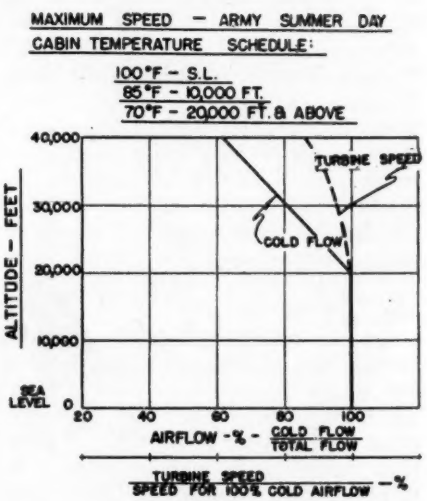
MAXIMUM SPEED – ARMY SUMMER DAY
CABIN TEMPERATURE SCHEDULE:
100°F – S.L.
85°F – 10,000 FT.
70°F – 20,000 FT. & ABOVE
ALTITUDE – FEET
TURBINE SPEED
COLD FLOW
SEA LEVEL
AIRFLOW – % – COLD FLOW / TOTAL FLOW
TURBINE SPEED / SPEED FOR 100% COLD AIRFLOW – %

Fig. 2. Ratio of cold flow to total flow.

▶ **Pressurization Necessary**–In addition to cooling and heating, another factor is added for the cabin conditioning problem, because at the high altitudes, pressurization is necessary to maintain pilot efficiency within minimum safety considerations, and with aircraft capable of flights above 50,000 ft., cabin pressurization will assume greater importance.

* Based on a paper presented by the authors before the Society of Automotive Engineers at New York City.

HYDRAULIC DEVELOPMENTS

Venturi principle utilized

Most conventional Power Brake Control Valves provide feel to the pilot by utilizing a pedal load reaction directly from the hydraulic pressure in the brake line. The reaction usually varies with the pressure at the valve itself rather than at the brake which is mounted many feet away. Consequently, an erroneous indication of brake pressure during application is experienced because of the pressure drop in the lines and fittings from the brake valve to the brake. This is usually not considered serious with low capacity, low pressure brakes associated with small to medium sized airplanes, but as airplane size and gross weight increases the error becomes more pronounced. Increased brake energy absorption requirements demand increased volume and higher rates of flow, but with conventional brake valve design these increases in capacity are sufficient to give poor indication of brake pressure as well as materially increased application time.

A new valve developed by Bendix Pacific combines the same true feel normally experienced under static conditions, plus the added features of extremely rapid filling of the brake cylinders and a pressure compensation approximately equivalent to the pressure drop in the line between the control valve and the brake. The rapid filling feature makes it possible to save weight by reduction in line and fitting sizes between the control valve and the brake. The pressure compensation feature provides an indication of the pressure in the brake cylinder during filling as well as in the static condition.

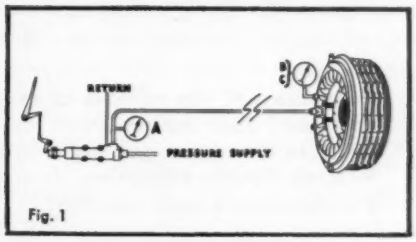

Fig. 1

Figure 1 shows schematically a typical test set up of brake control valve and remotely located brake. Pressure gauges are labelled to correspond with the curves shown in Figure 2.

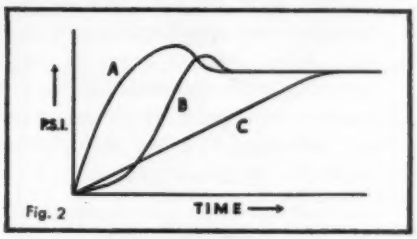

Fig. 2

In Figure 2 pressure application is plotted against time required for filling of the brake cylinders. These characteristics are observed if the brake pedal is provided with a limit stop set to the deflection required for rated brake pressure under static conditions. Curve C indicates the gradual pressure build up at the brake cylinders using a conventional valve. Curve A illustrates the rapid increase in pressure in the line at the brake port of the new valve while Curve B represents the pressure at the brake cylinder. It will be observed that the new valve gives a higher rate of filling because the high line pressure carried through to the brake port during application is used to ram the fluid on to the brake cylinders, hence time necessary to obtain response at the brake is substantially reduced.

LATEST development in the line of power brake valves designed and manufactured by Pacific Division is the new Bendix-Pacific Venturi (flow compensating) Brake Valve. The valve is suitable for inlet pressures up to 3000 PSI and brake port pressures up to 1000 PSI.

Utilizing the Venturi principle, rapid filling of the brakes is accomplished without the tendency to over-control the brakes. Although a larger volume is transmitted to the brake in a shorter time than in conventional valves, pressure increase at the brake is still smooth and positive.

Load reaction of the brake valve is synthetic during filling as the pilot does not feel the reaction due to line loss, and as the brakes take hold pedal reaction becomes proportional to the actual pressure exerted on the wheel.

Complete information of this and other Bendix-Pacific hydraulic controls will be supplied to firms requesting it on their letterhead.

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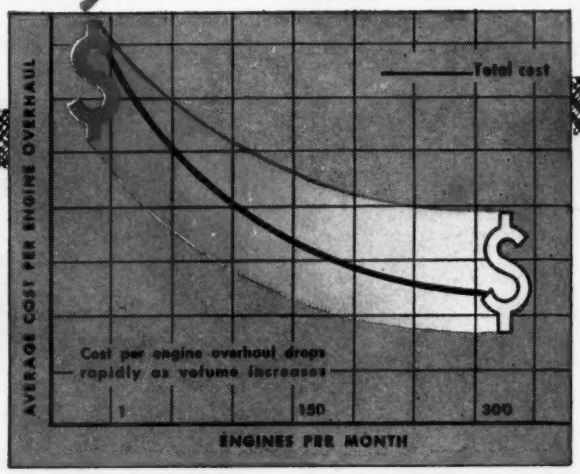
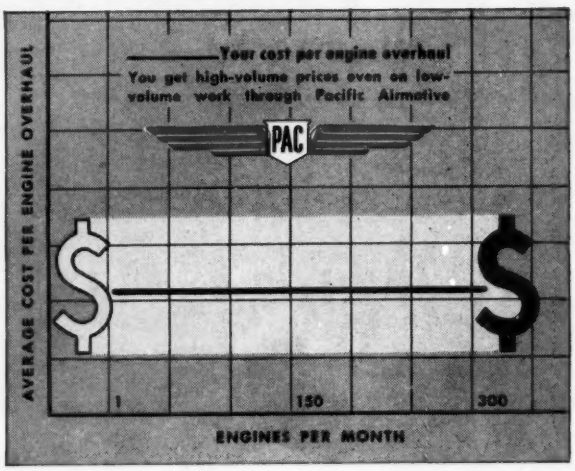
question for airline management . . .

How Much for Engine Majors?



Major engine overhauls are expensive—whether you do your own work or not—unless volume is high and constant. Typical cost charts look like this:

Regardless of the number of major overhauls you need each month, your cost *can* be low, because you can get high-volume savings through Pacific Airmotive. Your cost chart on PAC overhauls looks like this:



Here are the unvarnished reasons why you can get overhauls economically from PAC. Our volume is already high, so that your work goes in at a high-volume rate. Our overhaul bases throughout the country were built for volume and are superbly equipped with special-purpose tools and other facilities. After twenty years of experience, work procedures are systematized and efficient. Large inventories of parts are always on hand, and technical information from manufacturers is always available and always up to date.

Airlines and other aircraft operators now contracting their overhauls to PAC profit in these ways: 1. Their overhead for shops and tools, and likewise their capital investments, are at the bare minimum—a factor of vital importance during low-revenue periods. 2. Their cost per engine overhaul is the bottom obtainable figure. 3. Because of PAC's prompt service and high capacity, operators can maintain optimum regularity of service, even during peak or emergency conditions.

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SUPPLIES . . . PAC distributes more than 300 aviation lines through nine bases in the U. S. and Alaska. This includes engine, accessory, prop, and instrument parts and assemblies.

SERVICE . . . PAC furnishes engine, engine-accessory, propeller, instrument, and airframe maintenance or contract overhaul at five major bases in the U. S. and Alaska.

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AVIATION'S OLDEST AND LARGEST MAINTENANCE AND SUPPLY COMPANY

A minimum of 10,000-ft. cabin maintaining a 2.75 psi. pressure differential has been set up as a standard. Fig. 3 illustrates this pressure schedule as a function of altitude, and indicates that the maximum pressure differential for this 10,000-ft. cabin is reached at about 18,000 ft. When aircraft structure permits, it is desirable to have a greater cabin pressure than suggested by this standard.

Minimum pressurization required is a basic design consideration for determination of the size of the cabin cooling system. Pressurization requirements dictate the minimum allowable cabin air flow; therefore, this may well be the critical design condition for the cooling system.

▶**Cooling, Heating**—To make an analysis of the cabin cooling and heating loads, it is necessary to have the pressure and temperature of the engine compressor air bleed. This information, together with airplane speeds, heat transfer coefficients, etc., constitute the basis for an analysis of cooling and heating loads.

An air cycle unit utilizes the pressure drop available from engine bleed to accomplish cooling, so the bleed pressure schedule is the basic information from which the cooling performance can be derived. Bleed pressures and temperatures of a typical jet engine are given in Fig. 4. The assumed values on this curve are only intended to show trends to be expected in the pressure and temerature variation with altitude, and used to analyze the expected overall performance in the assumed airplane.

The cabin heating or cooling load consists of several factors which must be

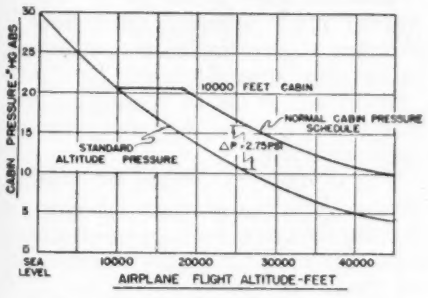

Fig. 3. Cabin pressure schedule.

analyzed to arrive at the total load.

By definition, the cabin cooling load or heating load is equal to the algebraic sum of all the cabin heat sources. The cabin load calls for cooling of the supply air when the sum of the heats added to the cabin is greater than the heat loss from the cabin.

▶**Heat Transfer**—Items usually considered are skin and canopy heat transfer, heat lost or gained from cabin air dumped overboard, solar radiation through canopy, electrical heat, and pilot heat. A plot of these variables is given on Fig. 5, which is based on reasonably assumed constants and cabin size. The detail effect of the cabin pressure schedule on the turbine pressure ratio available, and its subsequent effect on the loads, has been eliminated for sake of clarity.

Cooling or heating loads shown on the curve are referred to total ram temperature. Hence, the cooling or heating load is the heat which must be added or subtracted from the cabin supply air at full ram temperature, in order to maintain required cabin temperature. Inflection points on the curves result from the cabin temperature schedule, which is assumed as constant at 70 deg. F. above 20,000 ft.

Intersection of the resultant total load with the load from the dumped ventilating air is the altitude at which the cabin supply temperature is 70 deg. F., (cabin temperature). At this point,

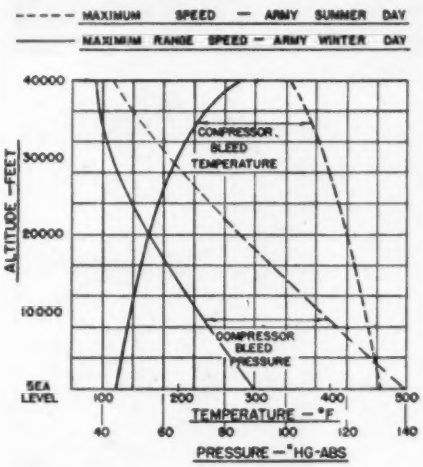

Fig. 4. Typical jet engine performance data.

heat supplied to cabin from the cabin air supply equals the heat lost from dumping cabin air overboard when both values are referred to the same temperature (full ram temperature).

▶**Heat Loss**—Also, the sum of the solar radiation plus electrical heat plus pilot heat equals the heat loss through the cabin walls and canopy. It is important to note that for all altitudes below the intersection point of 36,000 ft., the cabin supply temperature is colder than cabin temperature.

At 33,000 ft., resultant total load becomes zero—cabin supply temperature equals full ram temperature. At this point, if not for the pressurization requirement, it would be possible to maintain a 70-deg. F. cabin temperature with only ram air. Therefore, cooling of the air from full ram temperature is required at all altitudes up to 33,000 ft. This points out the necessity of cooling equipment in jet aircraft, even at high altitudes.

One point of interest on the curves is that due to the ram temperature rise of the skin, the cabin wall and canopy

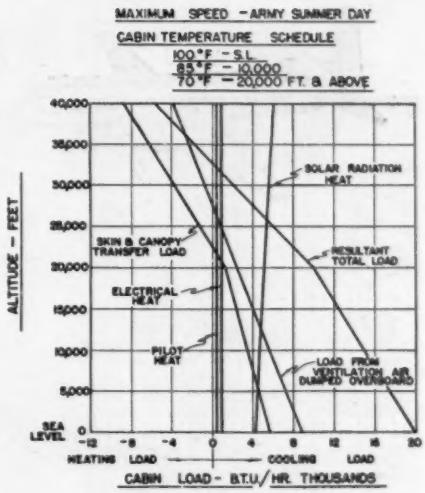

Fig. 5. Cabin cooling loads.

temperature does not reach cabin temperature (70 deg. F.) until 23,000 ft. And not until an altitude of 27,000 ft. is there any loss in cooling from dumping cabin air overboard. At this point, cabin temperature (70 deg. F.) is equal to full ram temperature, which is the reference temperature.

▶**Solar Radiation**—Importance of solar radiation heat should be noted since at sea level it is but 25 percent of the total cooling load, but becomes equal to the total resultant load at 26,000 ft. Thus, it can be seen that operation during various times of the day or night will present a somewhat different diagram, as influenced by solar radiation.

In the absence of solar radiation, which, for example, occurs during night operation, the resultant total load becomes zero at 26,000 ft. instead of 33,000 ft., as indicated on the curve.

The cabin temperature schedule shown on Fig. 5 is actual temperature, but the effective temperature is somewhat different, especially at sea level where the hot cabin walls and canopy radiate heat to the pilot.

One phase of the operation of the cabin cooling system that is not generally appreciated, is that the air cycle unit operates at nearly full capacity up to 40,000 ft. Fig. 2 indicates that the turbine operates at 100 percent speed, and at 100 percent cold flow from sea level to 20,000 ft., and about 95 percent speed and 80 percent cold flow at 30,000 ft.

This shows that only a small amount of the total air-bleed flow is bypassed around the cooling unit. At 40,000 ft., where the ambient temperature is 44 deg. F. below zero, the cabin still demands 62 percent of the total flow to go through the cooling unit. The reason for this is that even when there is no cooling load, it is necessary to cool the hot bleed air from the engine to a reasonable mixture temperature as dictated by the cabin thermal requirements. (*Continued on page 30*)

Cleaning and polishing the aluminum skin of the new, 40-passenger pressurized and air-conditioned *Convair-Liners* is a big job! And Consolidated Vultee picked Klad Polish to make the task easier. They find that Klad Polish does a *better* job, and saves many man-hours in cleaning and polishing those thousands of square feet of aluminum!

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►**Leakage**—Cabin leakage rates for a number of jet fighters has been shown by experience to be of the order of 3 to 4 lb./min. This is for a 10,000-ft. cabin with 2.75 psi. pressure differential. Fig. 6 shows that the leakage flow increases gradually from zero at 10,000 ft. until maximum is reached at about 18,000 ft.

Cabin leakage rate may be the critical design point in determining the size of the cooling unit. Altitude at which the leakage rate is most critical is where the ratio of compressor bleed flow to cabin leakage flow is a minimum. Once the cabin leakage at the minimum critical ratio has been determined, the minimum rated airflow required at sea level rated condition may be found in

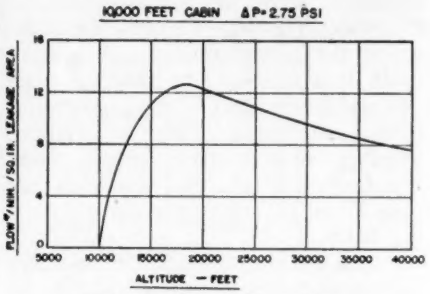

Fig. 6. Cabin leakage rates.

terms of pressure and temperature available from the engine at this condition.

► **Cabin Heat**—Heating of the cabin is accomplished from the heat of compression furnished from direct engine bleed into the cabin. Critical heating condition occurs when the compressor bleed pressure and temperature are a minimum and with the coldest skin temperature.

This condition occurs at sea level maximum range speed on an Army Winter Day. Sufficient cabin flow is provided at this condition to maintain cabin temperature above freezing. Cabin temperatures as low as freezing are permissible, in view of the infrequency of such operation.

For all other conditions, the heating flow available is more than sufficient to accomplish cabin heating, which eliminates the need for auxiliary heating in jet craft.

At intermediate conditions between full cooling and full heating, cabin temperature control is accomplished by proportioning bypassed hot flow with the cold flow. The mixing of engine bleed air is automatically controlled by a cabin temperature responsive mixing valve.

► **Mixing Valve Characteristics**—These are important considerations. It is necessary to include the effects of the valve on the cabin air flows. In Fig. 7, two flow curves are shown for valves having different overlaps.

Complete or 100 percent overlap, means that both hot and cold valves are

always partially open, except when the other is fully open. An overlap of 60 percent is with partial closing of either valve from full open before the other starts to open. This latter condition is represented by the inflection points at 20 and 80 percent actuator travel. For the purpose of illustration, the flow has been assumed to vary linearly with actuator position over the full range of travel.

The valve full cold flow requirements are determined on the basis of the required cold flow to accomplish cabin cooling for the critical sea level high speed condition. For the assumed airplane, a 12 lb./min. flow rating for the air cycle unit results. The actual full cold air flow, given in Fig. 7, is determined for the bleed pressure and ambient temperature conditions existing at the 30,000-ft. operating altitude.

Required flow area of the hot side valve is determined for the critical heating condition, which is maximum range speed, sea level and Army Winter Day. A full hot flow of 6.7 lb./min. through the valve would result at the 30,000-ft. condition.

A cabin load balance is reached when the heat from the supply air resulting from the mixture of hot and cold air

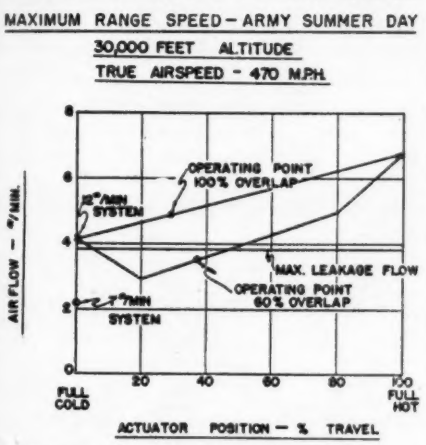

Fig. 7. Control valve characteristics.

equals the total resultant cabin load. The operating points for each valve when determined on this basis are indicated on the curves.

It was assumed that the cabin pressure schedule shown on Fig. 3 is used and that the maximum cabin leakage rate would be 5 lb./min. at the maximum flow point, 18,000 ft. This corresponds to a maximum cabin leakage of 3.9 lb./min. at 30,000 ft. as shown in Fig. 7.

The valve with complete overlap provides a flow of 0.8 lb./min. greater than the cabin leakage, a marginal difference. The valve with 60 percent overlap does not even provide sufficient flow to overcome leakage, which results in a partial loss of cabin pressurization. However, a reduction in cabin leakage would permit the use of partial overlap. This in-

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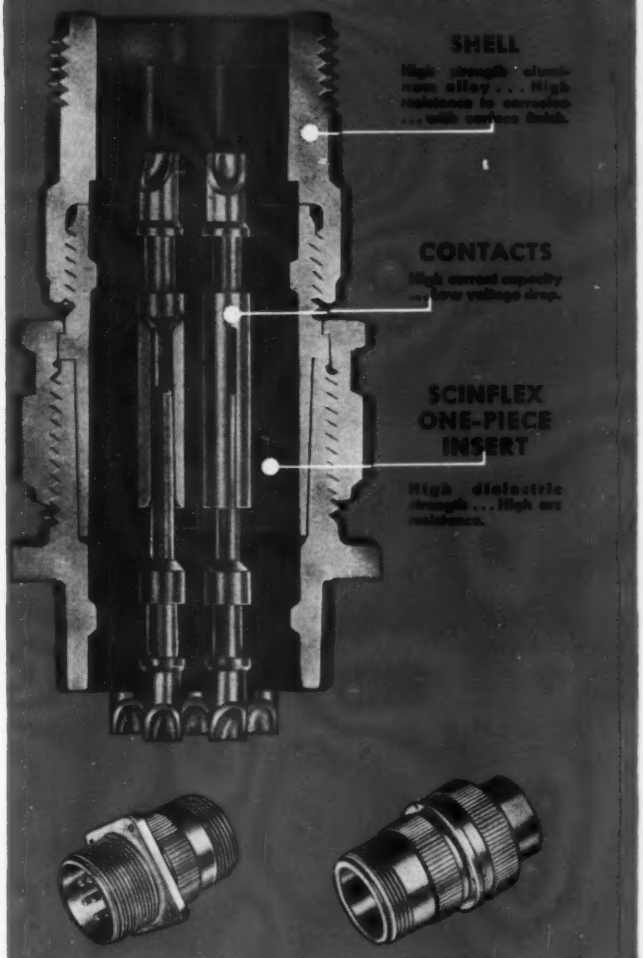

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dicates that the mixing valve design is, to a great extent, predicated upon the cabin leakage rate.

Indicated on Fig. 7, is the full cold flow for a 7-lb./min. cooling unit. Not considering the effect on cabin cooling with the reduced flow, it can be seen that cabin airflow is reduced in proportion to the system flow ratings. The use of a small flow cooling unit makes it necessary to use extreme caution in cabin design and manufacture so that the leakage flow is maintained less than the supply flow.

Practical considerations of the leakage rates obtained when reasonable care is taken to minimize leakage may indicate that the minimum flow rating of the cooling unit might be dictated by the cabin leakage rate.

▶ **Humidity Considered**—The effect of humidity on performance of the air cycle-unit must also be considered. Ambient air contains varying amounts of moisture and at low turbine discharge temperatures most of this is condensed. The heat lost from moisture condensation results in higher turbine discharge temperatures than calculated on a dry air basis. Unless the cabin temperature is lower than the dew point, the condensed moisture reevaporates in the cabin, releasing the heat of condensation, and thus still provides cooling equal to the dry air rating.

A cooling system, providing cooling to a point where cabin temperature is maintained at ambient static value, should not result in water or fog remaining in the cockpit, even with ambient air at 100 percent relative humidity. Because of difficulty of providing complete remixing by proper air distribution, the moisture may not completely reevaporate and the excess water is retained in the cabin.

▶ **Icing Problem**—With low humidities, it is possible to produce turbine discharge temperatures, including the effects of moisture condensation, below 32 deg. F. This results in the formation of an extremely fine fog consisting of ice particles in the discharge pipe.

Pipe roughness, protuberances, and bends in the pipe should be avoided to prevent ice formation at these points. A smooth, straight duct into the cabin is usually sufficient.

Opinions have been expressed that turbine discharge temperatures should be maintained above 32 deg. F. at the design condition in order to minimize the problem of duct icing. Many observations have been made with the turbine discharging the air into a room of relatively low humidity. The fog disperses and reevaporates in approximately one foot from the open duct.

This condition holds true for discharge temperatures as low as 25 deg. F. below zero. It is possible, however, that with higher moisture contents than existed during these tests, the icing problem could occur in a straight smooth duct. A sure solution to this problem could be to recirculate cabin air back to the turbine discharge pipe. This air could be recirculated by action of a jet aspirator. The small added back-pressure on the turbine required to produce the velocity for aspiration would be almost negligible.

Requirements for humidity control are not so important in fighter and general military craft as they are in commercial planes, where pressurizing and cooling are provided to obtain maximum comfort. Because humidity control and moisture removal are difficult no provision is made in the installation to afford humidity control.

With extreme airplane speed and increased engine bleed pressures, the use of existing type systems may become obsolete in that they may be no longer capable of cooling the cabin with reasonable bleed flows.

At very high speeds, the high temperature rise resulting from ram may require the use of a ram operated turbine which would cool the ram air before it is used in the heat exchangers. Rocket-powered missiles having no pressure air supply may be cooled by systems entirely ram operated. By combining systems and making use of more components, air cycle cooling can be provided so long as the intended operating altitudes are not too high.

▶ **Design Problem**—A major problem confronting the designer of cooling systems for high speed aircraft is the high temperatures of the air in some sections of the rotating units. Air temperatures of 350 to 400 deg. F. and even higher, require special consideration in the choice of materials, bearings suitable for high speed and high temperature, and lubricants at elevated temperatures.

Problems of providing increased cooling, together with the mechanical difficulties resulting from high temperatures, present a formidable challenge. Continued development in these small but important cabin cooling and pressurizing units will result in improved designs capable of providing greater performance at extreme speeds.

Pacific Airmotive Reports Net Loss

Pacific Airmotive Corp., Burbank, Calif., reports a 1947 net loss of $444,911, before a $179,000 Federal tax refund.

PAC is widely spread, with overhaul and sales units at Anchorage, Alaska; Oakland, Fresno, Glendale and San Diego, Calif.; Phoenix, Ariz.; Kansas City; and Linden, N. J. It acted quickly to begin a consolidation of these agencies when losses continued to develop.

▶ **Overhaul Base Closed**—In California the Oakland engine overhaul base was closed and its business diverted to PAC's new headquarters shops at Burbank. The Fresno and San Diego operations were closed.

Structure of the remaining bases is being tightened, and Linden, originally set up as an Eastern division headquarters, has been made a base with elimination of territorial divisions and consolidation of divisional activities at Burbank.

When it became apparent that discounts would be insufficient to maintain flying salesmen in the field, all such sales activity was brought into the Burbank home office.

▶ **Sales Hopes**—PAC officers now are taking aggressive steps to gain new sales outlets to dispose of close to $4,700,000 in inventories. Considerable hope is held for expansion of foreign markets.

More immediately, however, PAC will make strong overtures to Army and Navy to use the Burbank supply center as a purchasing base for equipment needed in the western area, offering a 35 percent discount on goods delivered as against a 50 percent discount reportedly offered by some East Coast manufacturing suppliers at factory.

PAC believes that its discount offering, although lower by 15 percent, will enable potential military customers to obtain equipment profitably from the Burbank warehouse when freightage and insurance of eastern-purchased equipment is taken into consideration.

Information Tips

Aluminum Data Compiled

Technical aid in aircraft industry metal-working phases is 48-page booklet titled "Aluminum Sheet and Plate," published by **Reynolds Metals Co.**, 2500 So. Third St., Louisville, Ky. Brochure contains information relative to various sheet and plate alloys, gages and sizes. Included is comparative analysis of cost factors of sheet and plate as against other metals, together with discussion of formability, weldability, riveting and joining, brazing, soldering, machinability, and resistance to chemical attack. Also given is explanation of heat-treatable and non-heat-treatable alloys. Final section of booklet is devoted to index of sheet and plate specifications as listed by various government bureaus and engineering societies.

For Brinell Testing

Catalog issued by **Steel City Testing Machines, Inc.**, 8843 Livernois Ave., Detroit, Mich., describes functions and characteristics of Brinell testing machine Model KDR. Unit is represented as being capable of checking up to 800 pieces per hr. and parts varying as much as ¾ in. in dia. and thickness without moving elevating screw.

Colorado Airmap

Of value to pilots is new state airmap offered by **State of Colorado, Division of Aeronautics**, Capital Bldg., Denver. Map is printed to scale of 1 in. to 16 mi., and in six colors with different shade for each

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Why You Cannot Get Ahead As Your Father Did —

THE UNITED STATES is being forced toward socialism by a tax revolution of far-reaching consequences.

We have not yet felt fully the deadly impact of this revolution because inflation and the postwar boom have delayed its effects.

But from now on, more and more people will feel its bite. Already it is the dominant element in our economic life. Already it is the major factor in our chances of keeping our jobs and of getting ahead.

Here are some pertinent facts on this tax revolution:

1. The tax load that our nation can safely carry has long since passed the danger point.

Our capitalistic system is in real danger when taxes take more than 20 percent of our national income (or 20¢ out of every income dollar). Beyond that point there are not sufficient dollars left in private hands for capitalistic America to raise the capital required to keep its industry going. So we are right now being nudged further and further into socialism.

For today taxes take *twenty-five* percent of national income (or 25¢ out of every income dollar).

2. The tax revolution has undercut the incentives that help us to get ahead.

The group whose incomes range from $5000 up now turns over about one-half of its *total* income to federal, state, and local tax collectors. Before the war, this group gave the tax collectors one-third of its collective income.

In sharp contrast, the group of people with incomes under $5000 pays the tax collectors 20% of its income for direct and hidden (mostly hidden) taxes—against 18% before the war. This lower-bracket group needs immediate tax relief but I believe most sincerely that persons earning less than $5,000 have a very vital reason for also supporting tax relief in the much more heavily hit upper brackets.

As you get ahead, you expect your taxes to go up. Taxes should be levied, in principle, according to ability to pay. But today tax rates rise so sharply that they virtually destroy all incentives to get ahead, to save, and to invest in new and untried enterprises that open up new jobs. *The progressive tax idea now carried to punitive extremes has become a destructive tax revolution.*

Today the U.S., envied by all the world for the wealth it has won under capitalistic incentives, has cut its incentives below those offered by that state whose police methods strike terror into the hearts of all workers.

Soviet Russia rewards successful managers, writers, and scientists better relatively than we do under our present tax system.

A revolution that sweeps away incentives will quickly sweep away our free enterprise economy. The only substitute ever found for free incentives is the whip-and-lash compulsion of the police state. And no police state has ever been able to match the production of a free people with a free economy that gives adequate rewards to individual producers.

3. The tax revolution hits squarely the average American's chances of keeping a job and of getting ahead.

If you make less than $5000 a year you may well ask why you should worry about a tax revolution that seems directed at the comparatively small group, about 10% of American families, who make $5000 a year or more.

The answer, it seems to me, is that "risk capital," the money that makes new jobs when invested in growing companies or in new businesses, must come largely from the people making more than $5000 a year. The others usually cannot afford to take any risks with their savings.

It was the savings of this 10% group that made possible the huge growth in American industry and American jobs and our progress in raising American living standards in the years before 1930.

Now the government is taking so much from the 10% group in taxes that they cannot afford to risk any savings they manage to accumulate. Most of their savings now go to insurance companies and savings banks which are barred by law from making risky investments or investments even in seasoned common stocks.

The flow of risk-capital from this 10% group can only be renewed by reducing their taxes. The result will benefit everyone over the difficult years to come by providing more and steadier employment for all.

The cost of the presently proposed reduction, *less than 1% of the national income,* can well come out of current revenue surplus. It will be repaid many-fold by the new enterprises it will stimulate.

4. Jobs will be lost if risk-capital does not increase.

Unless the flow of risk-capital into business *can be doubled* and *trebled* in the next few years, business investment in job-making new plants and equipment will drop sharply. The McGraw-Hill survey of prospective capital expenditures, reported in the previous editorial in this series, made that quite clear.

When such a drop in business investment has come in the past, it has brought with it a general slump in business – and unemployment.

As we work through the enormous demand for goods of all kinds built up during the war years, and as the war-accumulated savings of businesses and individuals are spent, it will be harder and harder to keep production and employment at today's high levels.

Then—at the very time that we shall need all our drive to maintain prosperity—we shall be hit by the full impact of the tax revolution.

5. Compounding these troubles is a tax system as out-of-date as an oxcart.

Twenty years ago, when taxes took only twelve cents out of the national income dollar, our rattle-trap tax system was little more than a nuisance. Today, when it takes twice as big a bite, its double-taxing of the earnings of investors, its discriminatory excises, and the overlapping of federal, state, and local levies are a fatal handicap. A new system, a fair system, a rewarding system, is a necessity if American initiative and enterprise are to have a fair chance.

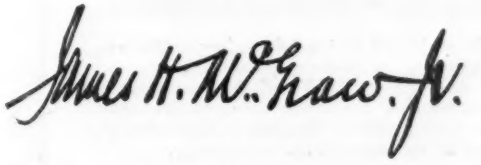
What Congress does now about federal taxes will bear crucially on our ability to sustain prosperity.

By demanding economy in government and by re-designing the tax system to stimulate initiative and risk-taking, Congress can multiply many times our chances of maintaining full employment and of raising living standards.

By allowing people to save more and by renewing the incentive to risk capital in new enterprises, Congress can actually insure a bigger tax return in the years ahead. More business will result – and pay more taxes.

That is the only way that a free people with a free economy can carry the tax load.

That is the best way that our government can improve our chances of keeping our jobs and of getting ahead. I suggest that you discuss these vital matters with your chosen representatives in Congress, in your state government, in your local community.



President, McGraw-Hill Publishing Company, Inc.

THIS IS THE 66TH OF THE SERIES

Pilot in a fog?

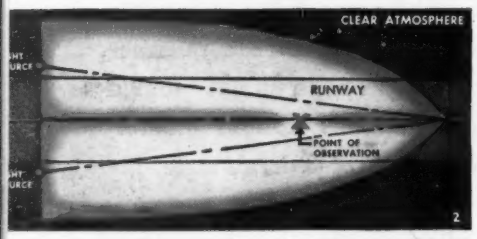
bring him in . . . on "contact" . . . with fully controllable beam

L-M-Bartow

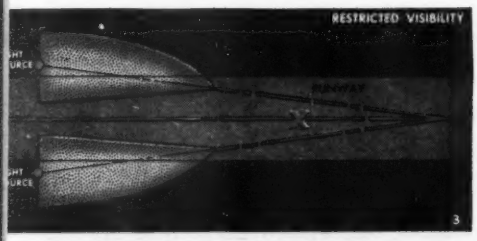
high intensity approach and runway lighting system

How to Control a Light Beam—and Why.

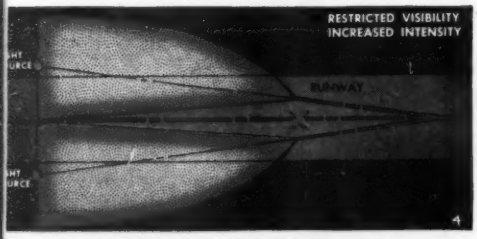
Diagrams show the effective "envelope" of a pair of lights, one on each side of the runway. This will apply to every pair of lights, which comprise the two *rows* the pilot sees.



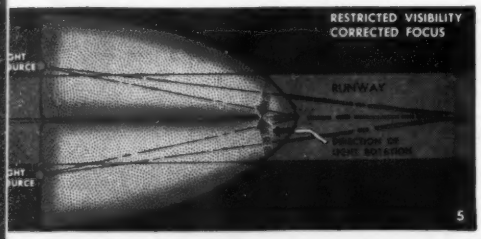
1. Clear weather. Note path of equal brightness along the landing path.



2. Reduced visibility—fog, dust, snow. The pilot can't see the lights—they don't reach him.



3. Increased brightness. But the lights still do not meet because fog, snow, etc., cut the distance light penetrates, not proportionately, but (how's your physics?) according to Allard's law.



4. So—with *L-M-Bartow* lights—beam direction is corrected. The towerman just sets a pointer to the day or night "visibility" the weatherman gives him. The simple synchronous motors—the one moving part in the units—automatically "cone in" the beams to the correct angle. (right)

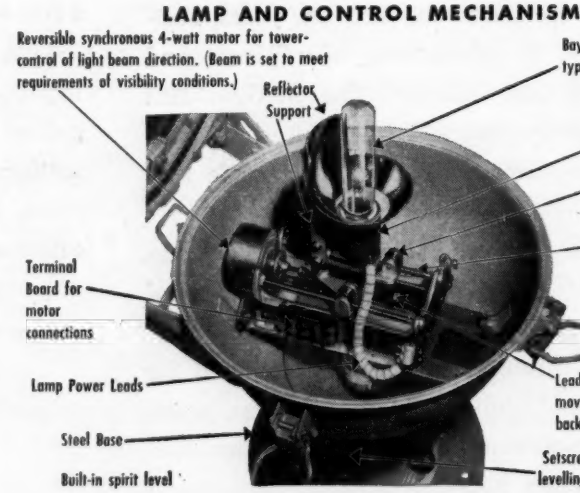
Any high intensity lights are better than the old type—but you can eliminate glare, and get much greater effect and penetration when you control *both* intensity *and direction* of the beam.

L-M-Bartow lights do just that—with their 180,000 cp fully controlled, glare-free beam. The diagrams at the left give an idea of why and how it is done.

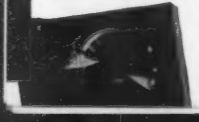
It takes experience to know these things, and a knowledge of what the pilot must see when he goes off instruments and onto contact. And it takes skill and engineering ability to work out the problem.

The flyer-engineers and lighting experts of Bartow Beacons, Inc. and Line Material Company have the ability and experience. *L-M-Bartow* lights, developed some years ago, were proved, and improved, during and since the war. Today more than 50 installations are in operation, dozens more on order, in U. S. and foreign countries.

LAMP AND CONTROL MECHANISM

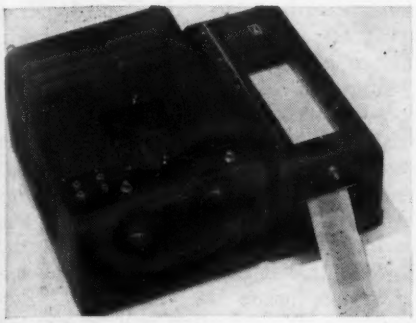

Reversible synchronous 4-watt motor for tower-control of light beam direction. (Beam is set to meet requirements of visibility conditions.)
Reflector Support
Bayonet-base projection type lamp—200 or 500 watts
Lamp Socket
Lamp Carriage Rollers
Tracks for movable lamp carriage
Terminal Board for motor connections
One of the four cover clamps
Lamp Power Leads
Lead Screw driven by motor moves lamp carriage back and forth
Steel Base
Setscrew for levelling light
Built-in spirit level

Easy to operate—even though the explanation may sound complicated. Better get the whole story—complete with diagrams—in the brochure, "The Lights that Bring Them In." **Write Line Material Company, Airport Lighting Division, East Stroudsburg, Penn.**



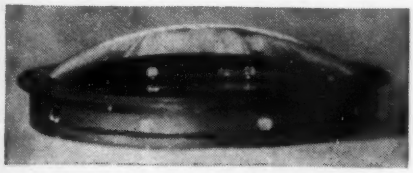
LINE MATERIAL Airport Lighting

NEW AVIATION PRODUCTS



Analyzes Strains

Designed for use with company's direct-inking oscillograph is new strain amplifier, Model BL-310, made by **Brush Development Co.**, Cleveland, Ohio. Equipment records either static or dynamic strains up to 100 cps., and direction as well as magnitude of measured strain can be read from chart. Primarily intended for use with Baldwin SR-4 120 ohm strain gage, unit is also applicable with any resistance sensitive pickup. It can be used to record pressures, temperatures, accelerations, forces, etc., provided equipment is calibrated in terms of pickup used.



New Astrodome

Designed for military and commercial aircraft, streamlined transparent dome consists of two plates to withstand 3½ tons total force, and surface projects only 2½ in. above plane's skin. Outer plate is large optical lens ground and polished to reduce refraction errors regardless of sighting angle. Inner plate is plastic and houses defroster system. Maker is **Bausch & Lomb Optical Co.**, 635 St. Paul St., Rochester, N. Y.

For Aircraft-Metal Cutting

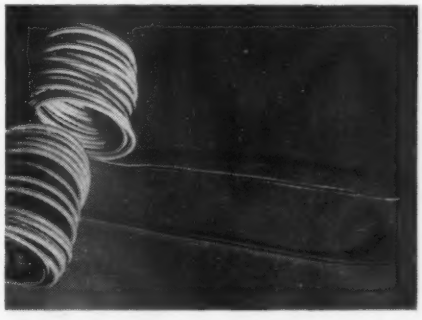
New No. 12 heavy-duty metal cutting band saw, with automatic cutting cycle and electrically controlled blade pressure, made by **Wells Mfg. Corp.**, Three Rivers, Mich., is offered with company's self-contained wet cutting system. Included is chip pan, fluid tank, centrifugal type pump-motor unit, splash guards and protective screens. Chip pan is mounted between bed and base. Working parts are accessible and valve permits adjustment of flow.

Wing-Nut

New self-locking wing nut, made by **Palnut Co.**, 58 Cordier St., Irvington, N. J., employs same type of thread engagement used in well-known "Palnut" design. Locking part of unit is cone with hole in center, whose inner edges are formed to pitch of screw thread. Inner edge is slotted to form closed-in spring jaws which grip screw thread when nut is tightened.

Flight Refrigerant

Seen as suitable in air freight operations is "Super-Ice," for preservation of perishable commodity shipments. Refrigerant is mixture of sawdust, salt, and other chemicals dipped in water and deep-frozen. In melting process, sawdust absorbs moisture and maintains desired humidity, keeping shipments colder than wet ice yet not as cold as dry ice. Maker is **Super-Ice Inc.**, 334 Magnolia St., Oakland, Calif.



Coded Tubing, Wire

Affording permanency of code identification in various conductor elements and circuits are thermoplastic tubing and insulated wire with integrally-extruded contrasting-colored striping. Manufacturer is **William Brand & Co.**, 276 Fourth Ave., New York 10, N. Y. In addition to permanency of codifying, possibility of impairment of dielectric factor of insulating tubing or insulated wire is eliminated.

Airborne Camera

"Syno-graphic" camera, designed for aircraft flight test purposes by **Flight Research Engineering Corp.**, Richmond, Va., is intended to record data synchronously from sources in widely separated locations. Instrument uses 16mm. film. Shutter speeds range from 1/25 to 1/1 sec.

Tips (Continued from page 32)

2000-ft. grade of elevation. All known airports are shown and all radio navigation information indicated. Complete airport directory appears on back of map. Data on runway lengths and facilities available at each field are also given.

Government Aviation Guides

Selected publications issued by U. S. Government through **Superintendent of Documents**, Government Printing Office, Washington, D. C. include: 1. "Student Pilot Guide"—Catalog No. C 31.106:P64/948—presenting 14 pages of information on which written student-pilot examination is based, together with outline of practices essential to safety. (Price 10¢.) 2. "Airport Design"—Catalog No. C 31.102:Ai 7/14—74 pages of data for persons charged with responsibility for site selection, planning, design, and construction of airports to assist in understanding general principles involved and in working out details of airport development program. (Price 20¢.) 3. "Airport Drainage"— Catalog No. C 31.102.AI 7/23—80 pages of information on development of efficient and economical drainage system for engineer responsible for recommending and designing airport drainage. (Price 30¢.) 4. "National Airport"—Catalog No. C 31.102:Ai 7/3—history of site upon which airport is built and describing airport itself. (Price 15¢). 5. "Small Airports"—Catalog No. C 31.1702:AI 7/20—30 pages of planning, designing, construction, operations, finance, and maintenance information. (Price 15¢.)

Aircraft Batteries

Reading Batteries, Inc., Reading, Pa., have published catalog describing performance characteristics of various aircraft batteries. Specifications, replacement data, and spacer design suggestions are included.

Data on Adhesives

Of interest to production engineers is 28-page brochure issued by **Minnesota Mining & Mfg. Co.**, 901 Fauquier Ave., St. Paul, Minn. Illustrated booklet contains case histories and formulas on adhesives and coatings pertinent to aviation industry.

Electrical Data Compiled

Illustrated 48-page catalog describing components for electronic and electrical industries, is published by **Hugh H. Eby, Inc.**, 4718 Stenton Avenue, Philadelphia, Pa. Drawings show pertinent dimensions of sockets, plugs, connectors, jacks, terminal strips, and wide variety of binding posts in many models and sizes.

FINANCIAL

Manufacturers Report Huge Losses

Deficits increased by charge-offs to take advantage of tax carry-backs. Result: clean balance sheets.

A number of well-defined trends are evident in the annual reports issued thus far by a group of leading aircraft builders.

For the most part, 1947 was a year of staggering losses for the manufacturers. In every instance where a loss was reported, solace was found in the statement that such results were peculiar to the industry as a whole.

▶ **Carry-back Lapse**—Further, as in most cases the past year was the last in which losses could be carried back against wartime profits, the tendency was to charge off as many items as possible to current operations. While this practice added to the deficit figures reported, it also had the tendency in many instances of bringing values down to more realistic levels.

By the same token, if and when conditions improve and as the rate of sales is accelerated, profits should become more predominant where cleaned-up balance sheets prevail.

Without exception, all aircraft builders cite the work of the President's Air Policy Commission and the Congressional Aviation Policy Board. The recommendations of these two groups are looked upon as a great encouragement to the industry's future.

Deficit operations were reported almost exclusively by those companies which had developed commercial transport planes. This group includes Douglas, Lockheed and Martin. Consolidated Vultee is also known to have sustained substantial losses in this activity but has as yet not issued its annual report.

▶ **Douglas Loss**—Douglas experienced an operating loss of $14,780,579 for the year ended November 30, 1947. This was reduced to a net loss of $2,140,579 as a result of tax carryback credits. The company reports that the Treasury Department is demanding $2 million in additional taxes for previous periods. While Douglas is contesting this claim, no special provision is made for this contingency. A surplus reserve for contingencies in the amount of $1 million exists but is not earmarked for any specific purpose.

It is particularly noteworthy that Douglas calls attention to the fact that United Air Lines looks to it for reimbursement of the value of the DC-6 airplane destroyed in the accident at Utah in October 1947 as well as for any claims payable because of loss of life. The liability for this claim has not yet been established. On the other side of the picture, United, in its annual report, does not call attention to this specific claim.

▶ **DC-6 Write-off**—While not indicated in the current report, another reason for the high Douglas deficit may be found in the accounting policy pursued in respect to the DC-6 program. A much higher ratio of development expenses are being charged to the initial planes being delivered. As an increasing number of this model are delivered, it is reasonable to assume that the rate of profit will increase.

Douglas remains in a healthy financial condition. Despite its deficit, the company saw fit to pay an annual dividend of $5 per share late last year. This merely represents a distribution of previous years' earnings. The company has a $5 million bank loan against a bank credit of $40 million which presently extends to June, 1949. This should keep it from experiencing any financial squeeze.

As of its 1947 fiscal year-end, Douglas showed a working capital of $55.5 million, a reduction of about $3 million from the previous year. Work-in-process, materials and inventory accounts were down to $34.6 million and are understood to be conservatively stated.

▶ **Lockheed Situation**—Lockheed reported an operating loss of $9,332,796 for the year ended Dec. 31, 1947, The company did not have any carryback tax credits to apply last year. However, it applied a gain of $6,255,341 resulting from the disposal of certain plant facilities to the government. This reduced the net deficit to $2,471,695 for the year.

Lockheed may stand to reap further benefits from the tax laws. The company estimates that it may carry forward losses of prior year to the extent of $6,300,000. This amount is subject to review by the Bureau of Internal Revenue.

In view of the favorable aspects of the tax laws in this instance, Lockheed wrote off $5,414,000 from the work-in-process inventory account representing the Constellation program. This should permit profits to accrue on deliveries of this type plane in the future. Based on present orders, the Constellation program is reported to continue into the first quarter of 1949.

▶ **Improvment**—Lockheed has also improved its financial position. During last year, a payment of $2 million against its $10 million serial loan was made. Further, since the first of this year, its $25 million bank loan was reduced to $15 million. The company reports that it expects to repay this entire loan before the year is out. Presumably this reduction will be effected by the sale of Constellations to TWA and under which Lockheed will endorse the chattel mortgages issued and to be payable by the airline through monthly installments.

The significant improvement in the Lockheed picture is the reduction in inventories from about $100 million to $45,224,396 as of the 1947 year-end. Here, too, the clean-up in the Constellation program is figured as being mainly responsible.

▶ **Martin's Loss**—The most staggering operating loss was reported by Martin. For the year ended Dec. 31, 1947, the company showed a net operating loss of $39,888,758. Carry-back and other tax credits reduced this figure to a net deficit of $19,181,526.

The Martin results reflect the write-down of the 2-0-2 and 3-0-3 transport development. Inventory in the amount of $22,089,497 was reduced by a change to cost of goods sold, to write the 2-0-2 program down to realizable values estimated at $7,980,432. Despite this write-down, the company estimates that present planes scheduled for manufacture will be produced without profit.

A number of observers believe that the 2-0-2 charge-offs should have taken place during 1946 when net earnings of $3,363,000 were reported and when built-up development costs were not amoritized.

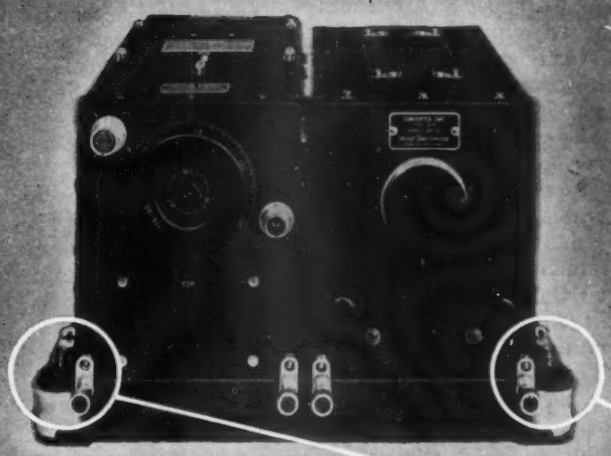
Martin shows a tax carryback credit of $20,355,977 for 1947. Of this amount, $18,294,296 has since been received with the balance currently in dispute.

▶ **RFC Loan**—In order to finance its operation, Martin secured loans totaling $26,775,000 from the Reconstruction Finance Corp. Such assistance refunded, in part, bank loans extended previously for a very short period by the Guaranty Trust Company of New York. About $15 million of the tax refund was applied toward a reduction of the RFC loan leaving a balance of around $11,500,000 payable.

—Selig Altschul

in Aircraft Radio...

Vibration Control Prolongs Tube Life —Provides Shock Protection



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Aircraft radio equipment offers an example of extremely delicate apparatus exposed to unusually severe vibration and shock. Its successful functioning demands the most efficient vibration isolation.

Aircraft Radio Corporation has accomplished such satisfactory isolation in this Type 15 VHF Omnidirectional Range Receiving Equipment through the use of Lord Plate Form Mountings in combination with a device manufactured by ARC.

The maximum in vibration and shock isolation is obtained through the use of Lord Shear Type Bonded Rubber Mountings—either on light, delicate instruments or heavy high-speed machines. Bring your vibration problems to Lord—Vibration Control Headquarters.

Aircraft Radio Corp. uses Lord Plate Form Mountings on aircraft radio equipment for positive protection from vibration and shock.

There is a Lord Vibration Control System that will improve the service of your product, lengthen its life, increase its sales.

Lord Multiplane Mountings are ideal for radio and communications applications. Send for your copy of Bulletin 106.

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Budapest Letter:

Aviation Stagnant in Hungary

BUDAPEST—Aviation is all washed up in Hungary.

No planes are being manufactured.

Accessories are not being turned out.

Aeronautical experiments are at a standstill.

There is only one airline, and that is half Russian-owned. It is being operated with beat-up converted American military aircraft.

Even gliding, a popular prewar sport, is not to be found.

* * *

Under its three-year plan, the Hungarian government has earmarked $3,315,000 for aviation. Practically all of these funds will be spent in restoring airfield and radio facilities. Hungarian flying fields took such a pounding during the war that repairs are almost tantamount to reconstruction. In view of the high cost and shortage of construction materials, the funds set aside for the three-year period (August, 1947, to August, 1950) are not impressive.

Prewar Hungarian aircraft manufacturing facilities were not extensive. During the war, two plane manufacturing plants were set up—the Dunai Repulogepgyar and the Manfred Weiss Heavy Industry plant. The former was pulverized by Allied bombers. The latter is still operating, but has undergone complete conversion to peacetime products. Civil aircraft are not being turned out.

* * *

The lone air carrier in the country is the Hungarian Soviet Air Line—which has a complete monopoly. HSAL is the successor of the prewar Hungarian Air Lines, which was a German-owned outfit. When the Soviet Army rolled into Hungary, the Russians took over the remnants of the airline—which they since have claimed as reparations.

When Russian administrators took over there was little left of Hungarian Air Lines. All planes had been destroyed. Not a single one of its airfields was in usable condition. In October, 1946, the Hungarian-Soviet Air Lines was founded as a new company. A special treaty was written between the two countries—which split the shares 50-50.

The equipment consists of 13 planes—a heterogeneous lot. All are U. S. military planes which had been sent to the Soviet Union during the war. They range even to reconnaissance jobs which have been converted into two-passenger craft for air-taxi hire. Servicing facilities are primitive.

The line crisscrosses the country, servicing six of Hungary's larger cities. Three outside daily runs are made. They are Budapest-Prague, Budapest-Warsaw, and Budapest-Belgrade. HSAL hooks in with other international airlines of Western Europe or Prague. Roughly, the line covers 900,000 kilometers.

Despite the battered equipment, the shortage of servicing facilities, and the small number of planes, HSAL succeeded in carrying 40,000 passengers and 300,000 kilos of cargo during 1947.

* * *

There is no immediate prospect of improvement of air operations in Hungary—since independent operators are unable to enter the picture. Also there is little likelihood of any plane manufacturing facilities being set up. In view of the circumstances, the Hungarian government has little alternative but to follow its present course of spending what funds it can for the rebuilding of airports.

To prime the pump on aviation, the government is trying to revive interest in gliders. There is a plan afoot to hold a glider competition in Budapest (with Hungarian, Russian, Jugoslav, and Romanian participants) in the summer of 1948. But that is the only thing foreseeable on Hungary's aviation front for the immediate future.

—**Paul Katona**

IATA Body Correlates No. 3 Area Practices

SYDNEY, Australia.—Most important work of the recent meeting here of Traffic Conference No. 3 of the International Air Transport Association was correlation of No. 3 area practices with other IATA areas.

This completes acceptance of uniform operating standards around the world.

Principal area covered by the conference extends from Afghanistan to Hawaii. All operators throughout this zone reached agreement on fares and cargo rates, subject to approval by their governments.

▶ **Agency Standards**—Machinery was set up to insure availability of a high standard of air travel agency facilities to the public.

Principles on passenger stopovers laid down at Rio de Janeiro were modified to allow an unlimited period for the life of the ticket along the passenger's route if specified at the time of booking.

Another important resolution permits air carriers to charge special low rates for transportation of certain types of cargo.

▶ **Subcommittees at Work**—Until the next conference, scheduled for September, subcommittees will be meeting to implement the decisions of the Sydney meeting and lay the groundwork for the next one.

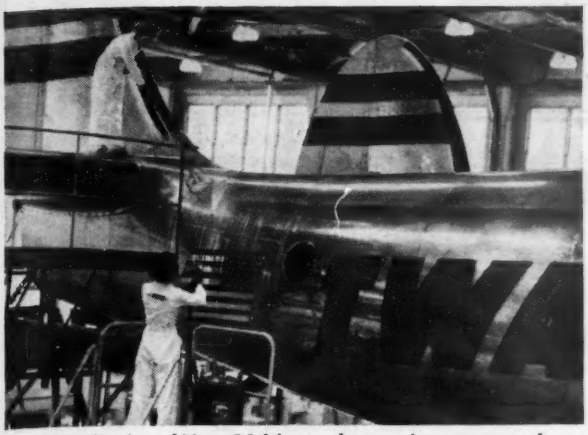
Eleven airlines from nine countries attended the meeting, second of IATA Traffic Conference No. 3 and third joint meeting of Conferences No. 3 and No. 1. Present were Air France, BOAC, British Commonwealth Pacific Airways, China National Aviation Corp., KLM Royal Dutch Airlines, New Zealand National Airways, Northwest Airlines, Pan American Airways, Philippine Airlines, Qantas Empire Airways and Tasman Empire Airways.

Hastings on Tour

LONDON—Handley-Page and the Ministry of Supply are preparing to send a production-model "Hastings" transport on a 26,000 mile demonstration tour from London to India, Australia and New Zealand.

The "Hastings," a freight-cargo transport plane for both military and civil use, is in regular production and already is going into service with the RAF. Its passenger version, the "Hermes," is still in the development stage. 25 "Hermes" IVs are on order for BOAC.

Australia and New Zealand are the principal targets for the flight.



"Spray application of Turco Mulsirex and water rinse saves man-hours and materials; promotes safety by facilitating aircraft inspection and repair," says R. C. Loomis, Director TWA Maintenance & Overhaul.

Transportation Saves Millions of Man-hours As Science Substitutes for Elbow Grease

Photo Courtesy Helms Bakery

Eight years without repainting, truck finish still in excellent condition, thanks to Turco's consistent, planned cleaning program.

Photo Courtesy New York Central Railroad

New Turco methods and materials cut cleaning time of heavily grimed coaches to 3.25 man-hours...formerly took 12 man-hours.

Airlines, Bus Systems, Railroads Turn to Surface Chemistry to Win Battle Against Costly Cleaning Bills

New materials and methods developed by Turco Surface Chemistry affect great reductions in cost and man-hours. Turco has valuable information for you for your cleaning and maintenance of exterior and interior surfaces, and for the removal of greases, oils, carbon, paint, and other deposits from motors, parts, fittings, and other surfaces.

Turco's proposition:

Upon request we will completely survey your maintenance and cleaning requirements, conduct practical demonstrations where desired, and furnish a report with recommendations.

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- ☐ Food
- ☐ Institutional Sanitation
- ☐ Manufacturing
- ☐ Metal Working
- ☐ Railroad
- ☐ Other

AW

Pennsylvania Supreme Court Rules for Airport Operator

Noise comparison used in important Chester County property owner test case reversal.

By ALEXANDER McSURELY

Another long legal step toward emancipating the airport from legal entanglements created by nearby property owners is seen in a recent Pennsylvania Supreme Court decision. The Court ruled in favor of M. R. Krader, operator of an airport near Malvern, outside Philadelphia, in Chester County.

The case was appealed by Krader and his co-defendant, Andrew F. Gallagher, owner of the land, after a Chester County common pleas court had entered a decree that operation of the airport would constitute a nuisance, and issued a temporary injunction, later made permanent, prohibiting aircraft operation at the field.

▶ **Proof Inadequate**—Supreme Court opinion, signed by Justice Drew, held that evidence in the record "is entirely inadequate to prove the existence of a nuisance," and cites plaintiff's testimony to show how it fails to make such proof. This was part of testimony:

Plaintiff Francis D. Crew, owner of property adjoining the airport's western boundary, testified:

"Q. Is it not a fact that your testimony here today has been based upon the fact that there have been only one, two or three planes at this airport?

A. Yes, but our reason for objecting here today is not what has gone on in the past but what we expect in the future."

Justice Drew points out: "all of plaintiff's witnesses were allowed to indulge in this type of conjecture and to speculate as to what might occur in the future, e.g. 'It is going to be very objectionable.' "

One of the plaintiffs was Rush Hospital, an institution located a mile away. The hospital superintendent, testified that the only private planes which had flown low over the hospital grounds had done so 10 years ago, an incident which was admitted to have no connection with the new airport.

▶ **Test Case**—The Malvern case has been regarded as an important test case for aviation, since it first was started about two years ago. Aircraft Owners and Pilots Association and nearby veterans' groups, who planned to take flight training at the field when it was opened, worked with Krader in preparing his defense.

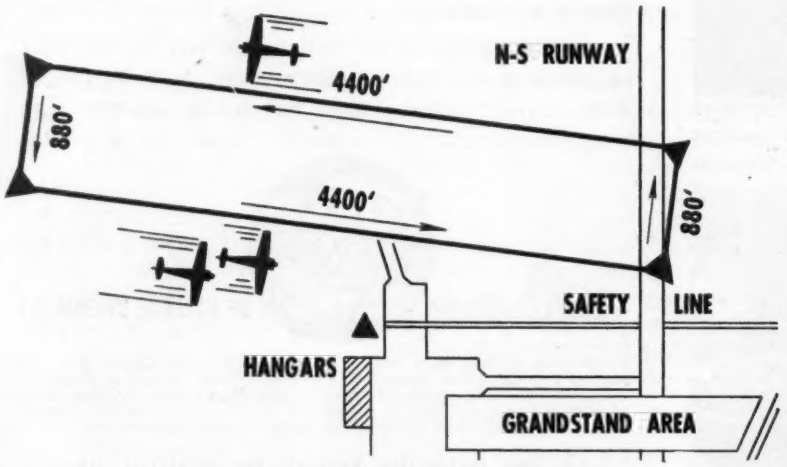
At AOPA request, CAA aircraft noise measuring instruments were brought to the field, from Indianapolis, and noise comparison tests were run. These later were introduced at the trial. While results of these tests are not mentioned specifically in the supreme court decision, the opinion states: "The testimony discloses no additional volume of objectionable noise in comparison with the existing noise level in the immediate vicinity of the proposed airport. Farm tractors, passenger cars and heavy trucks on the adjacent highway, trains on the mainline of the (Pennsylvania) railroad nearby and military and transport aircraft having no connection with the airport in question, already disturb the tranquility of this neighborhood."

An important factor in the court's decision was the fact that the airport had not yet been put into actual operation.

▶ **Before Plane Use**—A short time after construction was begun and before any planes had used this airport, the opinion relates, "this action was begun to prohibit the use of this property as an airfield. Even at the time of trial, the field had been used only by a few small airplanes at infrequent intervals. It could not be generally used because construction had not been completed on either runway.

"Defendant Krader testified that the proposed airport was to be used only by airplanes powered by single engines not in excess of 200 hp. No night flying and no regularly scheduled commercial flights were contemplated. Student pilot instruction was planned together with sale of light airplanes and renting of hangar space to private plane owners."

Area surrounding the airport is described as rural and sparsely settled with country estates and farms. The Pennsylvania Railroad "main line" runs about a mile north of the property. The north boundary of the field is on a main highway, Route 202, heavily traveled by cars and trucks. One industrial plant in the area is located a mile away. Plaintiffs included 18 residence owners and representatives of three institutions. None of the buildings were less than 500 ft. from the airport, and some were located over 3 miles away.



1948 GOODYEAR COURSE

New course for the 1948 Goodyear Trophy midget plane races, at Cleveland Airport, Sept. 4, 5 and 6 will be rectangular and all in front of grandstand. Last year both spectators and participants complained about a stretch behind the stands. As drawing indicates, new course is virtually a one-mile straightaway in front of the stand, a 90-degree turn, and another mile-straightaway in the opposite direction, with an 180-degree turn to complete the lap. While race will be limited to 32 entries, prospective competitors have asked Goodyear for more than 150 sets of plane specifications.

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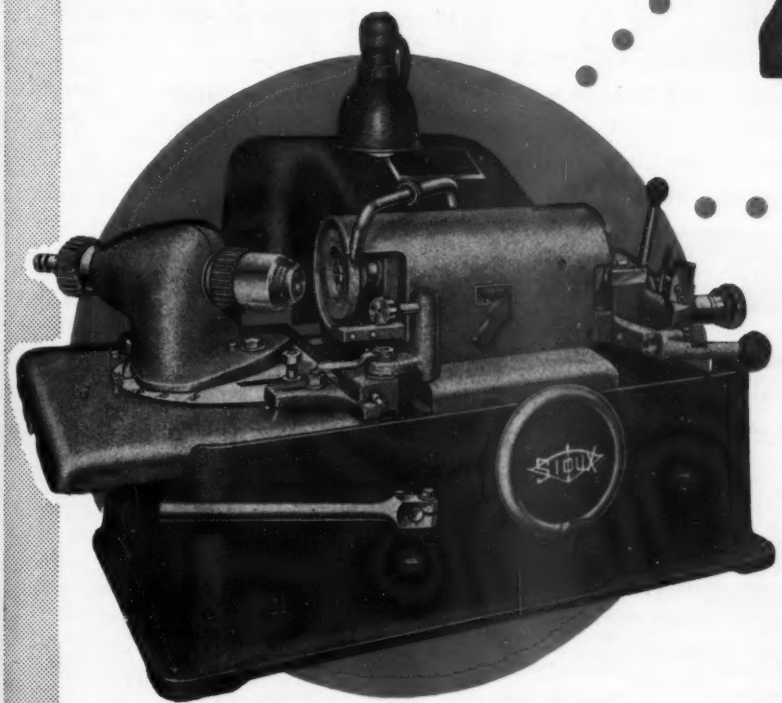

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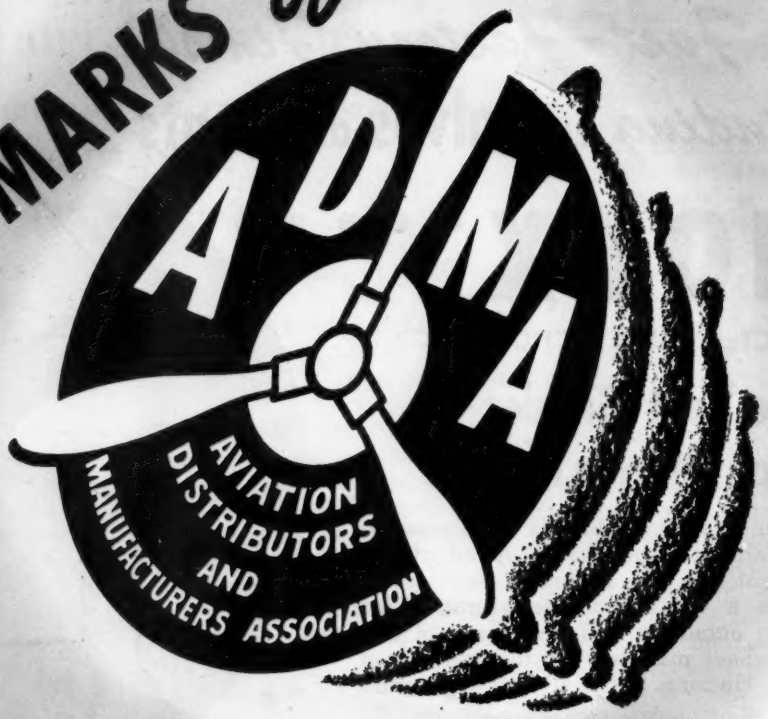

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▶ **Reasons Cited**—Listed as reasons by the plaintiffs for the charge that the airport necessarily would become a "nuisance per se" were: a. Noise; b. Danger from falling objects; c. Dust; d. Interference with Malvern school; e. Bright illumination at night; f. Presence of large crowds; g. Depreciation of property values; h. Interference with breeding of livestock. Justice Drew states that "no serious attempt was made to prove any allegation but that the noise from the airplanes would constitute a nuisance."

From a legal standpoint, the case is probably most important within the state of Pennsylvania, where it is understood to be the first of its kind ever tried.

One statement in this decision doubtless will be cited by attorneys of other states in future airport cases:

"There is nothing in the construction of an airfield or in the necessary consequences of its normal operation in an agricultural district to create a nuisance."

Justice Drew thus re-affirmed the principle that there must be provable damage.

▶ **Door Not Closed**—However, while the decision is clearly of benefit to airports and their airport operators, it does not close the door to future legal action by the property owners.

"After the establishment of a regular flight pattern, if airplanes fly very close to plaintiff's buildings or in any other way cause real damage to plaintiff's property, adequate relief in equity will be available to them.

"The decree is reversed; the injunction is dissolved and the bill is dismissed at appellees' (property owners) cost." Justice Drew concludes.

Charcoal Used in Rain-making

Commercial use of burning charcoal in "rain seeding" of clouds over parched farmlands is believed to be in use for the first time by a new rain-making firm, Weath-Air, organized on the West Coast by Paul Mantz.

Announcing creation of the company, Mantz said that until now military security has prevented disclosure of the use of burning charcoal as a precipitant with effect similar to that of seeding clouds with dry ice or silver iodide. Weath-Air, using heavily equipped B-25 and TBM airplanes, uses all three techniques—according to cloud conditions encountered.

Associated in the firm are Stanley and Darrow Thompson, and C. A. Bonney, all of Flagstaff, Ariz. Stanley Thompson recently completed technical training with General Electric's rain-making staff at Schenectady, N. Y.

PIG IS NAVION PASSENGER

Hyland Farms, Peoria, Ill., wanted to get a prize Duroc hog to Columbus, Ohio, for the National Duroc Show, and asked Rex Howard, Navion distributor at Peoria, to help out. Howard took off the Navion canopy, unbolted the rear seats, and loaded the crated hog into the airplane. Two hours later the prize hog was at the show. The pilot reported that the animal laid down and went to sleep when the plane reached an altitude of 8000 ft. The stock farm said that the same trip by truck would have required a minimum of 10 hours of hard driving, exhausting the show animal as well as the driver.

Amphibian Prototype Ends Long Flight

A twin-engine six-place amphibian prototype, designed and built by Meredith Wardle, Wilmington, Del., has recently completed a "shakedown" flight in easy stages to Miami, Fla. and back to Essington, Pa.

Designated the Model W-6 Aqua I Amphibian, it is powered with two 125 hp. Lycoming engines turning fixed-pitch Sensenich propellers. Of composite metal and plywood construction, the amphibian can be built on a production basis to sell at a price of $15,000 to $18,000, Wardle estimates.

▶ **Two Years in Development**—The plane's builder started the amphibian development two years ago. He is a graduate of Massachusetts Institute of Technology, was previously associated with Curtiss-Wright at Buffalo and Bellanca at New Castle, Del. He has his offices at his home, 1601 Harrison Avenue, Silverside Heights, Wilmington.

He quotes the following performance data as actual flight test results, with airspeeds ground course calibrated: Cruising speed 125 mph. at 70 percent power at sea level, carrying 1250 lb. useful load (6 persons); rate of climb, 750 ft./min. with 1250 lb. load, or 1250 ft./min. carrying three persons, and 40 gal. fuel; takeoff with 30 degrees flap and 5 mph. wind, as 3-place, 45 mph. and 200 yd. (10 sec.) water run; takeoff as 6-place under same conditions, 60 mph. and 400 yds. (18 sec.) water run.

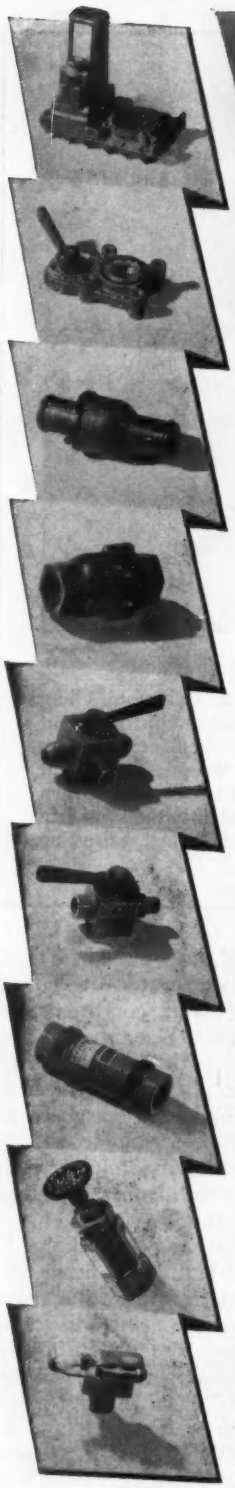
Landing speed with 50 degree flap, 40 mph. as three place, or 52 mph. as 6 place; Hovering speed in gusty air with ample control, 50 mph., with 40 degree flap and carrying four persons; Single-engine performance as four-placer, 100 mph. at 1500 ft.

▶ **Strength**—Cabin is designed to be highly crash resistant, with heavy aluminimum I-beams running from major wing to hull framework, including twin columns running diagonally forward from wing mainspar to hull. Full-cantilever wings have seven ribs per panel, and are all-metal as are upper and aft portions of hull. Bottom and nose section are plastic-bonded plywood with plastic finish. Cabin has 38 sq. ft. of Plexiglas window area, and cabin space is 192 cu. ft.

Plane has an 800-mi. range, if carrying four persons, with 60 lb. baggage, and if carrying six persons, with 50 lb. baggage, has a 400 mi. range, Wardle says.

▶ **Dimensions**—Other specifications and dimensions reported: Span, 36 ft. 5 in.; length, 29 ft. 6 in.; height, 12 ft.; hull width, 4 ft. 2½ in.; tread, 10 ft.; wheel base, 10 ft. 2 in.; gross weight 3600 lb.; weight empty, 2200 lb.

Provision is made for a tricycle retractable landing gear, with two rear



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wheels folding into the underside of stub seawings, and the nosewheel retracting into hull. Cabin is unobstructed by bulkheads. Wingtips are cushioned, and buoyant. Hull design is a modified NACA design, selected for non-porpoising and minimum spray characteristics. Electric booster pump and cross feed line furnishes dual fuel pump standby for each engine.

St. Louis Area Plans

Long range plans that call for an ultimate 31 airports in the St. Louis area have been approved by the CAA. The agency also forecast that ten public airports, together with existing private fields, will be needed in the next few years on the basis of present municipal predictions for aviation expansion in the St. Louis area.

The long range plan calls for 22 of the proposed airports to be in Missouri and nine in Illinois. In addition to three major fields, including the present Lambert-St. Louis Field, there would be six Class 3 airports, and 22 for training and private flying. Total will include airports for passenger, cargo and freight operations, for training, and private flying.

Preparation of the "St. Louis Metropolitan Area Plan" was accomplished by the City of St. Louis.

Lederer Elected President Of Flight Safety Foundation

Election of Jerome Lederer, chief engineer for Aero Insurance Underwriters, as president of the Flight Safety Foundation has been announced by Dr. Eugene F. Du Bois, chairman of the board.

The Flight Safety Foundation is a non-profit organization dedicated to greater air safety through research, experimentation, education and services in the fields of design, equipment and practice.

Lederer has been chief engineer for Aero Insurance Underwriters since 1929, except for two years when he served as Director of Safety Bureau of CAB.

Skymotive Gets Chicago

Skymotive Aviation Management, Chicago, has assumed operation of Maitland Airstrip and Chicago Marine Air Terminal under a 10-year lease arrangement with the municipal port director. The strip has been city operated since last October when Lange Aviation Corp. ended its occupancy.

Skymotive plans an extensive building program during the next decade. It is scheduled to begin when the city completes a paved runway at the field.

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But don't overlook this: ***the float plane market is wide open.*** There are over 30,000 planes in use right now that could be converted to floats. Conversions will bring you in hard cash, also keep those planes in use instead of forcing them on the market to compete with your new models.

As for new planes, floats form a market barely touched. Your missing customers are down at the beach, or alongside a river or lake. They want just what the floatplane can give them—water sports and quick access to vacation spots.

It may strike you as foolish, in these days of sales resistance, to ask a tough prospect to spend a bit more and get a floatplane. But remember, you're selling a means to the end all pilots want—a plane with real sport and utility. It's a plane that will stay sold with its owner.

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So don't despair and jump in the river. Use that water to produce sales and profits. Floats are available immediately in all models. Ask your aircraft distributor for details. Or write to Edo for the facts, plus news about float base developments in your territory. Cash in now on the biggest market in aviation.

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Atlantic Aviation Expands

Expansion of facilities at Baltimore and Wilmington has been announced by Atlantic Aviation Service.

Ground has already been broken for the construction of a new hangar needed to meet increased aircraft servicing needs at each of the company's bases, now located at Baltimore Municipal Airport, and New Castle County Airport, Wilmington. The hangars will measure 100 by 120 ft. with lean-to's on either side to house office lounge and shop facilities.

The New Castle operation will absorb most of the service and shop work on larger aircraft now conducted by Atlantic at DuPont Airport, Wilmington. Company hopes to have the hangar at each airport completed by June.

Spraying Firm Sued

Damages of $7701 against Central Aircraft of Yakima, Wash., are sought in a suit filed in Yakima County superior court by Mr. and Mrs. Ronald F. Barber, who claim the aircraft firm failed to control insect infestation in their orchard, as provided in a contract.

As a result, they said, their apple and pear crops were total losses.

Al Baxter, a partner in Central Aircraft, said his company was working on an experimental program to control orchard pests by applying insecticides from the air. He said the plaintiff and others with whom similar contracts had been signed were notified that the aerial applications were not sufficiently effective to properly control coddling moth. Baxter said he advised the plaintiff to go ahead with regular hand applications of insecticides before any serious damage had been done to the orchards by the moth. Others who followed this advice produced good crops last year, he said.

Rescue Manual

After months of preparation, the Oregon state board of aeronautics has completed a manual on search, rescue and safety, containing a detailed plan for promoting air safety and outlining procedure in rescue of lost pilots and air passengers. A statewide organization has been formed utilizing state, military and civilian facilities.

The organization includes the state highway department, state police, forestry department, county sheriffs, CAP, CAA, Army, Navy, Coast Guard, American Red Cross, newspapers, radio facilities and medical forces.

Search and rescue coordinating headquarters and staff will be located in the office of the state aeronautics board at Salem, state capital.

BRIEFING FOR DEALERS & DISTRIBUTORS

SPRINGFIELD'S AIRPORT PROBLEM—Aviation people at Springfield, Ohio are unhappy about the lack of foresight shown in arrangements being made to sell the town's old municipal airport, following the completion of a new municipal airport. A clause in the sales contract of the old field provides that the purchaser of the site must agree not to use it as an airport for 30 years. Explanation for this amazing clause, is that city officials do not want the old field to be in competition with the new one. However, the new field makes no provision for privately owned and business planes, and hangar facilities comparable to those at the old field cannot be made available at the new field without considerable extra expense. With a general trend toward more airports in most forward-looking communities, including those Ohio cities immediately competitive with Springfield, such as Dayton, Columbus, Cincinnati, and Toledo, the Springfield action appears to be handicapping that city in the future. It is understood that a buyer who wishes to operate the old field as an airport has made an offer for the field. There is a question also about the expenditure of some $150,372 in federal funds which has been made on the old airport, in addition to local tax money expended, which will be diverted from its intended purpose when the field is closed. Aircraft Owners & Pilots Association has petitioned Oscar Fleckner, Springfield city manager, to hold a public hearing on the proposed sale arrangement.

SILVAIRIZING—A new trade-in arrangement for old "stick and rag" 65 hp. airplanes has been announced by Luscombe Airplane Corp., Dallas, as probably the most novel solution to the trade-in problem yet offered. The idea is for Luscombe dealers and distributors to accept any old airplane that will fly, providing it is powered with a 65 hp. Continental engine and has 6 by 6 wheels. The plane will be ferried to the plant at Dallas, where the engine, wheels and tires will be removed and attached to a new all-metal Luscombe airframe. If instruments are usable as well as engine, wheels and brakes, allowances as high as $1,000 may be made for the old planes in trade-ins for the allmetal conversions which in this case would cost $1495 for a standard 65 version, or $1695 for a special 65. When the trade-in was complete, the pilot would still have an old engine in his new airplane, but at least it gives the engine manufacturers something to think about.

FOUR TALKS A WEEK—It helps some, publicity wise, of course, if you win the Thompson Trophy first, but Cook Cleland, of Cleveland, Ohio, former Navy pilot, and operator of Euclid Avenue Airport, is now merchandising aviation to the public at the rate of four talks a week at various service, professional, business and boys' clubs. Many other operators, if they took the trouble to make some preliminary contacts, could do similar merchandising in talks to clubs. They ignore, or are unaware of public interest, and desire for information, about a subject which seems old stuff to the average operator. Cleland flies to his out-of-town engagements in a light plane and makes them free, charging it off as an advertising item on his budget. Incidentally, Cleland is expected to be back in the Thompson competition at Cleveland Municipal Airport come next Labor Day, with his Wasp Major-powered FG-2 Corsair.

SPARTAN CHANGES—Capt. Max Balfour, director of Spartan School of Aeronautics, Tulsa, and the affiliated Spartan Aircraft Co., has announced assignment of Tony Ming, former general manager at Tulsa, to Camden, N. J. to head the recently opened Spartan Aero Repair Base at Camden Airport. Fred Tolley, manager of Spartan's Aero Repair at Tulsa, has been advanced to general manager. Spartan also has announced plans to open a seaplane base on Grand Lake, at Port Aspenwall, near Fairland, Okla., for Spartan flight students desiring water ratings. Initial equipment includes a hangar with 110 ft. ramp to the water, and three floatplanes. Students will be housed and fed at the lakeside base.

AERONCA SEDAN CERTIFICATED—Receipt of CAA certification on the new four-place Aeronca Sedan model 15AC, puts the four-placer fully into the family-size plane competition with plane production scheduled during the current month. Price-tagged at $4795 flyaway Middletown, the Sedan has an all-metal wing, with single strut brace, and uses steel-tube fabric covered fuselage, and conventional fixed landing gear. Power plant is the new 145 hp. Continental engine. As one of the lowest priced four-placers on the market, the Aeronca Sedan may be the means of pulling its manufacturer farther up into the running in the lightplane competition—where it was a leader before the bottom dropped out of the lightplane market. Aeronca has also announced appointment of William B. Runvan, Jr. as service manager, and H. C. Pettit as assistant sales manager, succeeding Runyan.

—ALEXANDER McSURELY

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Policy Bills: From CAB to Taxes

Seventeen bills introduced in House and Senate to back up recommendations of Joint Aviation Policy Board.

The Congressional Aviation Policy Board has told Congress what it thinks must be done to promote a sound and progressive air transport industry.

Seventeen bills to implement the Board's Mar. 1 recommendations were introduced in the Senate by Owen Brewster (R., Me.), who served as the Board's chairman, and in the House by Rep. Charles Wolverton (R., N. J.), who was a member of the Board. Early action is planned on the measures by both the House Intersate and Foreign Commerce Committee, of which Wolverton is chairman, and the aviation subcommittee of Senate Interstate and Foreign Commerce, of which Brewster is chairman.

The program provides:

• **CAB** would be greatly strengthened. Salaries of Board members would be boosted from $10,000 to $12,000 a year. CAB would be completely divorced from the Department of Commerce, even for housekeeping purposes and provided with a $12,000-a-year executive director, appointed by Board members.

Present CAA functions of promulgating, administering and enforcing regulations relating to airmen, certification and airworthiness of aircraft; air carrier operating specifications, and other rules relating to the economics of operation would be lodged in the Board.

The present air safety investigation activities of the Board however, would be transferred to a $12,000-a-year director of air safety, who would be completely independent of both the board and the Department of Commerce.

• **CAA** would be reduced to an Office of Civil Aviation in the Department of Commerce. The office would be headed by a $12,000-a-year government service career appointee who would preside over a federal airways service and integrate the office's activities with the military.

• **Contract air services**—domestic, overseas, and foreign—would be brought completely under CAB safety and economic regulation. This would give the Board a stronger regulatory hand over international contract operators than it has over scheduled international carriers. The Board has several times requested, but never obtained, authority from Congress to regulate rates of scheduled international carriers.

Contract air carriers who by reason of "the casual and occasional nature" of operations or "the limited size and number of aircraft employed" do "not substantially affect the operations of any certificated air carrier or licensed air contractor" would be exempted from CAB regulation.

• **New equipment financing**, one of the air transport industry's major problems, is covered in three measures. Legislation underwriting five-year aeronautical research and development programs by the Air Force and Navy would promote government development of transport as well as military plane types.

Liability, which has been a major stumbling block to equipment trust financing of new airline equipment, is removed by releasing persons having a security interest or title to civil aircraft from liability for injury, death or property damages—unless the craft is in their possession at the time of the accident. A third bill authorizes the Maritime Commission to develop lighter-than-air rigid ships for commercial operations.

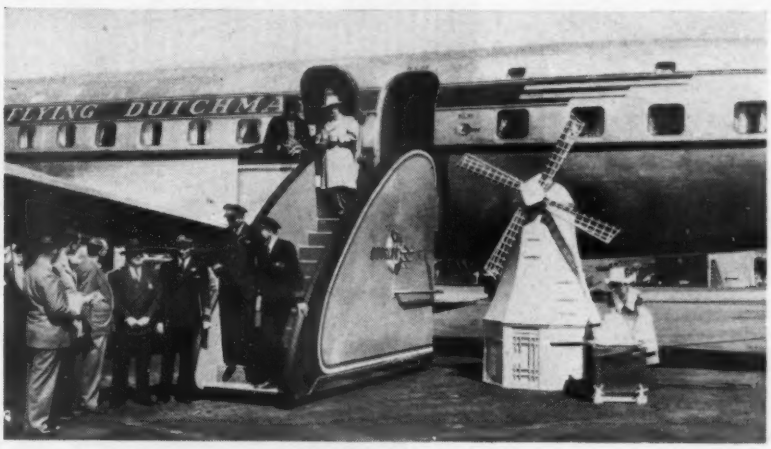
• **Tax measures** to remove the 15 percent transportation excise levy on passengers and three percent on cargo, and lay down a formula for allocation of air carrier taxation by the states so as to preclude multiple taxation. The multiple tax bill provides that the real property and tangible personal property of air carriers permanently located are taxable within the state where located.

Five factor points would be weighted in allocating the tax base of an air carrier's operating property, operating revenues, or capital stock, among states: Passenger, freight and express tonnage originating and terminating in a state would account for two points; revenues originating in a state would account for two points; and scheduled aircraft arrivals in and departures from a state would be weighted one point.

Five points also would be weighted in allocating the tax base of a carrier's net income among states: Passenger, freight and express tonnage originating and terminating in a state would account for two points; revenues originating in a state for two points; and wage and salary payments to persons employed by the carrier in a state would be weighted one point.

The measure also exempts airmen operating in interstate or foreign commerce from state registration, and directs the Secretary of the Treasury and the governors of the states to draw up a federal-state plan for aviation fuel taxation within a year.

• **Overseas facilities.** Sweeping authority is given the CAA administrator to acquire or construct airport facilities in foreign territory and to train foreign nationals in their operations to promote the U. S. international air transport system. The national military establishment is also authorized to transfer, with-



KLM's FIRST DC-6

First DC-6 to sport the Flying Dutchman markings of KLM took off from Santa Monica, Cal., last month on its delivery flight to the Netherlands. From left to right, standing beside three KLM flight crew members, are M. T. Gates, mayor of Santa Monica; Donald W. Douglas, Jr.; A. M. Rochlen, director of public relations for Douglas; and V. E. Bertrandias, Douglas vice president-export sales. At right, a special Easter cake baked for Queen Wilhelmina is being packed for shipment.

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Exceptionally light. Completely dependable. Designed to accomplish a specific cooling job with maximum efficiency. That's another way of saying this widely-used aluminum intercooler is a product of Harrison Temperature Engineering.

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out compensation, its overseas airports and aeronautical facilities to the CAA and Weather Bureau for operation.

To further development of the domestic airways system, the CAA administrator is given sweeping power to acquire, by condemnation if necessary, areas or properties required for air navigation facilities.

• **Air mail and parcel post.** Two measures would greatly increase government business to the airlines. One bill would authorize a domestic parcel post service along the lines recommended by the Post Office Department. It would limit the field to the certificated carriers.

The rates proposed—ranging from 55 cents for the first pound and 4 cents for each additional pound in the first and second zones to 80 cents for the first pound and 65 cents for each additional pound in the eighth zone—are substantially higher than those of the bill sponsored by Rep. Ed. Rees (R., Kans.) and favored by the independent air freight operators. Another bill provides for the shipment of non-airmail first-class mail by air where air shipment would expedite delivery and where "available air and ground facilities are adequate" for the shipment.

Other measures provide for joint state-federal enforcement of air safety regulations; a comprehensive Weather Bureau investigation of thunderstorms to promote air safety; and establishment of a 14-member joint House-Senate Congressional committee on aviation policy to follow commercial air transport developments, as well as other aviation fields, and make biennial recommendations for their progress.

Top Airline Salaries Show Increase in 1947

Reports of nine carriers show most executives receiving small increases over 1946.

Most domestic airlines paid their top executives slightly higher salaries in 1947 than in the previous year, CAB reports disclose.

Of the first nine carriers to announce 1947 salaries, four raised the pay of their presidents. In two cases there was no change, in two there was a small decrease, and in one no comparison is available because of a shift in the presidency.

▶ **Increases Listed**—Chicago & Southern Air Lines President Carleton Putnam received $26,000 in 1947 against $23,312 in 1946. Salary of Continental Air Lines President Robert F. Six was boosted from $24,166 to $27,292, and that of All American Aviation President Robert M. Love from $14,782 to $15,000. Mid-Continent Airlines President J. W. Miller received $19,999 in 1947 and $15,959 in 1946.

Sigmund Janas, president of Colonial Airlines, was paid $18,000 in both 1946 and 1947, and C. E. Woolman, president and general manager of Delta Air Lines, also was paid $18,000 in both years. Croil Hunter, president and general manager of Northwest Airlines, received $45,000 in 1947 against $46,500 in 1946. Hawaiian Airlines President Stanley C. Kennedy was paid $6,000 in 1947 compared to $7,010 in 1946.

▶ **WAL Shift**—Terrell C. Drinkwater, who took over as president of Western Air Lines on Jan. 1, 1947, received $34,999 last year. His predecessor, William A. Coulter, was paid $15,000 in 1946.

Salaries of other executives in 1947, with 1946 payments where available in parentheses:

▶ **All American**—Charles W. Wendt, vice president and treasurer, $10,000 ($10,000); Halsey R. Bazley, vice president-operations, $10,000 ($10,000); David L. Miller, secretary, $5,250 ($4,800); Harry S. Fries, assistant treasurer and assistant secretary, $6,225 ($6,000); Walter C. Gebelein, comptroller, $6,450 ($6,000).

▶ **Chicago & Southern**—Sidney A. Stewart, executive vice president, $24,999 ($6,968); Junius Cooper, vice president and treasurer, $15,000 ($3,750); Richard S. Maurer, secretary, $11,250 ($9,250); R. S. Scrivener, assistant treasurer, $5,100 ($4,980); Erma Murray, assistant secretary, $4,620 ($4,500); T. H. Hambleton, assistant treasurer, $2,562.

▶ **Colonial**—Edward S. Ridley, vice president, $9,999 ($10,000); Branch T. Dykes, vice president, $13,500 ($12,000); Alfred M. Hudson, vice president, $9,133 ($8,700); Sigmund Janas, Jr., vice president, $7,600; James F. Gormley, treasurer, $6,425; Warren C. Cooper, Jr., secretary, $1,650; K. Hamilton, secretary, $6,000 ($6,000); W. J. Byrne, treasurer, $4,583 ($6,666).

▶ **Continental**—C. C. West, Jr., vice president, $13,833 ($10,749); O. R. Haueter, vice president, $14,417 ($13,250); Ronald C. Kinsey, vice president, $5,000; Joseph A. Uhl, secretary and treasurer, $10,917 ($9,733); Dorothy Rylander, assistant secretary, $3,155 ($2,734).

▶ **Delta**—C. E. Faulk, chairman of the board, $12,000 ($12,000); Charles H. Dolson, vice president-operations, $17,048; Laigh C. Parker, vice president-traffic, $12,000 ($12,000); L. B. Judd, comptroller and assistant secretary, $9,600 ($9,400); Travis Oliver, treasurer, $1,200 ($1,200); C. H. McHenry, secretary, $1,200 ($1,200); Catherine Fitzgerald, assistant treasurer, $3,675 ($3,600).

▶ **Hawaiian**—Alexander Smith, vice president and secretary, $13,333 ($13,840); Ford Studebaker, vice president, $13,333 ($13,120); David Watson, treasurer, $7,333; Raymond G. Laclergue, assistant treasurer, $7,200 ($6,477).

▶ **Mid-Continent**—J. C. Collins, vice president and secretary, $9,600 ($8,633); J. A. Cunningham, vice president-operations, $10,800 ($9,348); H. W. Coburn, vice president-traffic, $9,000 ($7,509); C. H. Calhoun, vice president-engineering and maintenance, $9,000 ($8,130); W. L. Walker, treasurer, $6,250; W. D. King, assistant treasurer, $4,787; P. H. Carr, assistant secretary, $3,675.

▶ **Northwest**—E. I. Whyatt, executive vice president, $20,000 ($22,250); L. C. Glotzbach, vice president and assistant to president, $17,000 ($15,700); A. E. Floan, vice president and secretary, $17,000 ($15,700); K. R. Ferguson, vice president-engineering and planning, $18,000 ($18,000); W. Fiske Marshall, vice president-operations, $18,000 ($18,000); R. O. Bullwinkel, vice president-traffic, $15,000 ($13,500); L. S. Holstad, treasurer, $15,000 ($13,500); Frank C. Judd, regional vice president-Western region, $15,000 ($14,100); D. J. King, regional vice president-Orient region, $16,258 ($12,187); Charles Stearns, assistant secretary, $9,100; W. J. Elden, assistant treasurer, $10,150.

▶ **Western**—Leo H. Dwerlkotte, executive vice president, $19,999 ($19,371); Stanley R. Shatto, vice president-engineering and maintenance, $6,902; C. N. James, vice president-operation, $15,000 ($14,622); Marvin W. Landes, vice president-service, $9,569 ($2,545); Richard A. Dick, vice president-sales, $9,569 ($2,545); Paul E. Sullivan, vice president and secretary, $10,200 ($9,822); Ronald C. Kinsey, vice president, $4,800 ($6,581); Robert K. Light, assistant secretary, $2,624 ($3,472); D. P. Renda, assistant secretary, $2,148; J. J. Taylor, treasurer, $9,277 ($8,022); Robert H. Purcell, assistant treasurer, $1,080.

FEEDERLINE SALARIES

Trans-Texas Airways President Richard E. McKaughan received the highest salary during 1947 among top executives of five feederlines which have reported to CAB.

McKaughan was paid $18,362. Joseph L. Dyer, president and general manager of Florida Airways, received $12,500; Robert J. Smith, president of Pioneer Air Lines was paid $12,000 (compared to $9281 in 1946); J. H. Connelly, president of Southwest Airways Co., $10,000; and Nick Bez, president of West Coast Airlines, $6000.

▶ **LAA President**—C. M. Belinn, president of Los Angeles Airways, experimental helicopter service, received $12,000 in 1947.

Salaries of other feeder executives:

• **Florida Airways**—Marion D. Holman, vice president, $9600; Oscar Bergstrom, vice president, $9600; M. J. Brown, secretary-treasurer, $9600.

• **Pioneer**—Harold B. Seifert, vice president-operations, $8300; E. W. Bailey, secretary-treasurer, $6500.

• **Southwest**—J. G. Ray, vice president, $10,000; A. W. Johnson, treasurer, $9000; C. H. Sullivan, assistant secretary and counsel, $7200.

• **Trans-Texas**—L. D. McKaughan, vice president, $2642; James V. Allred, vice president, $2835; Robert O. Parker, secretary-treasurer, $3191.

• **West Coast**—H. A. Munter, vice president $12,000; G. R. Cook, vice president, $9600; W. A. Castleton, secretary-treasurer, $4800.

FEEDER OPERATIONS IN 1947

	Average Passenger Load	Average Mail Pay Per Passenger	Average Passenger Ticket
Challenger	4.50	$32.58	$12.84
Empire	2.76	40.29	11.59
Florida	1.33	55.11	6.91
Monarch	3.30	35.85	12.13
Pioneer	7.72	16.40	12.37
Southwest	8.30	9.19	7.95
Trans-Texas	1.42	87.34	10.05
West Coast	6.15	9.63	6.90
Average	5.65	17.47	9.61

Attack on Feeder Cost Renewed

Post Office Department lines up with Harllee Branch against further increases in temporary mail payments.

The Post Office Department has joined retiring CAB Member Harllee Branch in calling for a broad investigation of feeder operations which do not show reasonable promise of success.

In a letter to CAB, Post Office Solicitor Frank J. Delany declared the Department is in agreement with Branch's stand against further increasing the temporary mail rates of short-haul carriers.

He said his office strongly believes an immediate probe is in order to determine whether Challenger Airlines' Rocky Mountain routes can be rearranged or possibly consolidated with those of Monarch Air Lines' to reduce dependence on government subsidy.

▶ **Procedure Suggested**—Delany added that "if no plan can be found to reduce the constantly mounting government subsidy required to maintain Challenger, the investigation should then determine whether the continued existence of this system—and other feeder routes of like dependency—is justifiable."

Meanwhile, in a new dissent against the latest move of CAB's majority to raise temporary feeder mail rates, Branch cited extensive statistical data to back his stand for a probe leading to possible service suspensions. He indicated it is the duty of CAB to make some reexamination of short-haul operations which after a period of months have shown an "almost infinitesimal amount of public patronage and an ever-mounting cost to the government."

▶ **Three Probes**—Branch has now specifically advised investigations of Challenger, based at Salt Lake City; Monarch, which operates out of Denver; and Trans-Texas Airways, Houston. The Board's majority this month raised the temporary mail pay of Monarch and Trans-Texas in accordance with show cause orders issued earlier (AVIATION WEEK, Mar. 15). CAB has issued a similar show cause order to Challenger and probably will increase soon that carrier's mail compensation.

In his dissent, Branch said the history of CAB's temporary mail rate orders for feederlines is indicative of the increasing costliness of the experiment. Originally the Board set a 25 cents a plane mile rate for feeders, but this level has now been boosted to a maximum of 65 cents a plane mile.

▶ **Additional Payments** – Additional compensation to be paid the three western feeders as a result of the latest upward rate revisions is estimated at about $700,000 for 1947 and 1948. Of this, Monarch would receive $354,000, Challenger $211,000 and Trans-Texas $134,000.

Branch pointed out that Monarch—in operation 16 months—achieved an average load of only 3.3 passengers per plane mile in 1947 and that Trans-Texas in about five months' operation attained an average passenger load of only 1.42 passengers per plane mile. Florida Airways, which operated during most of 1947, averaged 1.33 passengers a plane mile, and Empire Air Lines, active since September, 1946, flew about 2.76 passengers per plane mile in 1947. Feeders as a group averaged 5.65 passengers per plane mile, mostly with DC-3 equipment.

▶ **Government Aid**—The CAB member declared that a comparison of the amount the government pays per passenger with what the passenger himself pays illustratees the disproportionate support which the government is giving these services. The average feeder passenger in 1947 paid $9.61 for his ticket. The government, through mail compensation, paid the carriers an average of $17.47 per passenger.

Branch noted that the only service received by the government for the money spent by it is represented in mail volume handled. Reports for 1947 indicate Monarch carried an average of 2.33 lb. of mail per mile; Trans-Texas 15.1 lb. per mile, and Challenger 45.2 lb. per mile. Average for all feeders was 30.2 lb. Mail pay per mail ton mile in 1947 was $46.91 for Monarch, $79.66 for Trans-Texas and $25.72 for Challenger.

▶ **Progress Noted**—"Some of the feederlines have shown steady progress," Branch conceded. But he said other short-haul carriers have found so little demand for the services performed that the cost seems out of all proportion to the public benefit.

For those carriers handling only meager traffic volume, Branch suggested it might be advisable to curtail schedules where the business potential does not warrant two roundtrips daily. He added that suspension of all service on some segments might be in the public interest.

AAXICO Suspends Nonscheduled Flights

American Air Export & Import Co., Miami Springs, Fla., largest nonscheduled U. S. passenger carrier in the postwar period, has suspended operations indefinitely.

All of the company's remaining flight equipment—four DC-3s, 32 spare engines and a large stock of spare parts—will be offered for lease or sale. AAXICO will keep its nonscheduled air carrier operating certificate and letter of registration current and will continue its business of buying and selling aircraft, and doing aircraft maintenance at Miami International Airport.

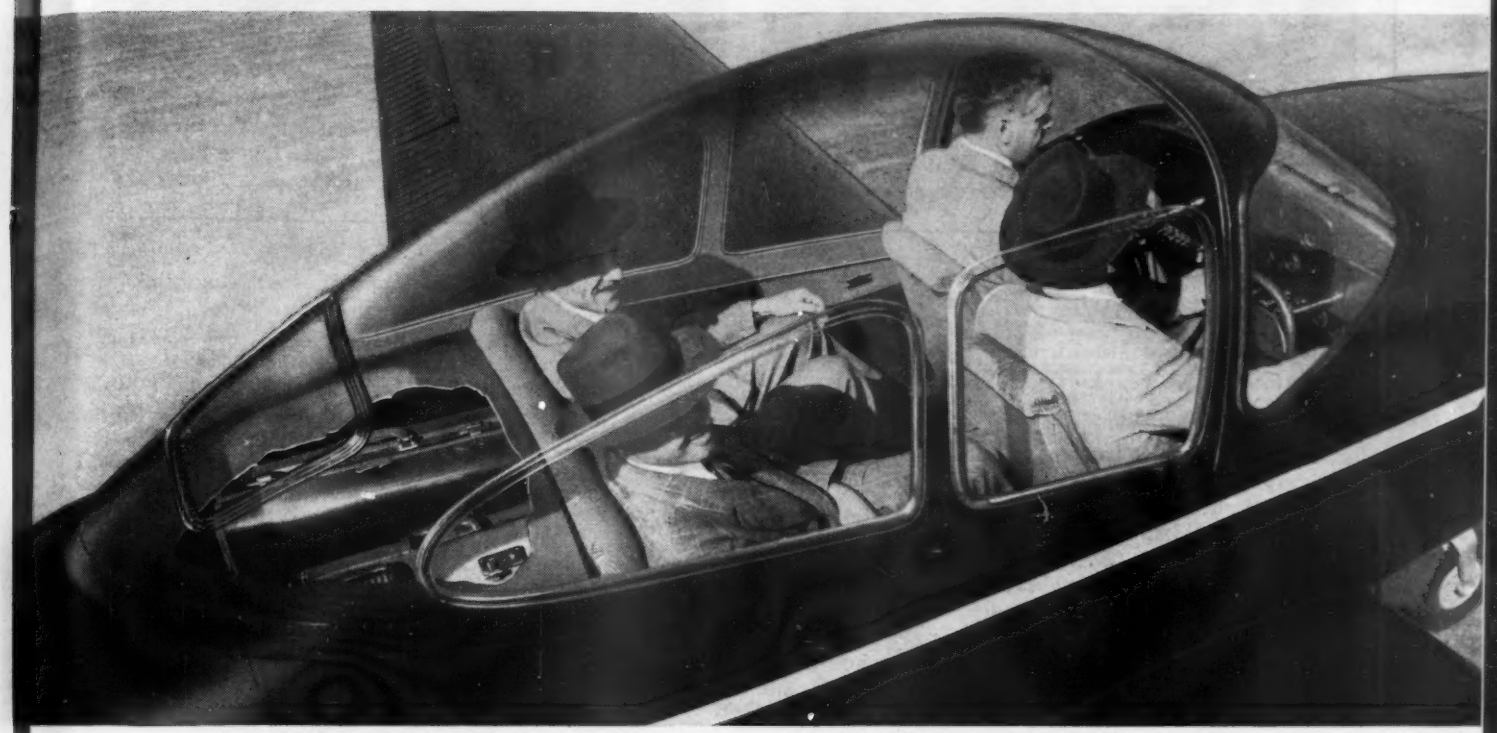
President Howard J. Korth said his company feels that the various restrictions constantly being placed on passenger-carrying nonscheduled operators have so reduced the possibilities of a sound, economic operation that it is advisable to suspend service pending clarification of CAB's policy. In the past two-and-a-half years AAXICO flew 100,000,000 passenger miles without a fatality.

Emphasizing second-class "air coach" service to the Caribbean area, the carrier at one time had nine DC-3s, 33 complete flight crews, 250 employes and five offices on the East Coast and in Puerto Rico. AAXICO applied for a certificate to conduct all-expense tours within the U. S. and the Caribbean.

PAL DC-6 Service

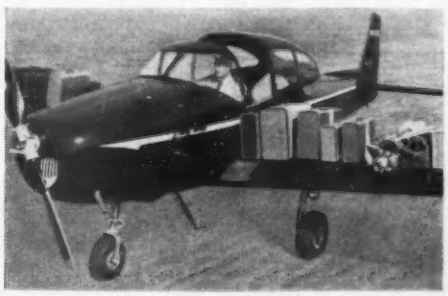
Philippine Air Lines plans to place DC-6 equipment on its San Francisco-Manila route May 14. The carrier is currently using DC-4s.

"MOST COMFORTABLE, ROOMY PLANE"...say Navion Owners



"A REALLY FULL-SIZED 4-PLACE CABIN"—"Most comfortable"—"Restful and relaxing"—"Superb visibility"—those are the answers several hundred *Navion* owners gave when asked what they thought of their planes. So what a surprise they'll get when they see the new *Ryan Navion*, which has gone even further to earn the title of America's most comfortable personal plane. Front seats are individually adjustable, ventilation is draft-free, and improved sound insulation makes the 1948 model one of the quietest airplanes. "Performance!"—"We get there fast—Safely"—"Short field landings and takeoffs" were other top-ranking comments. In the modern, service-refined design of the 1948 *Ryan Navion* are blended all of the most desired characteristics...no unbalanced extremes in performance have been sought at the sacrifice of other important qualities.

"SAFE"—"EASY-TO-FLY" was No. 1 on the long, favorable list of comments about the 150-mph *Navion*. Almost every owner stressed stability in rough air, comfortable, relaxed flying and effortless control. Inter-connected rudder and ailerons and special wing design are some of the reasons why *Navion* gives super-smooth flying.



"RUGGED"—"DON'T HAVE TO BABY IT"—"Can really take it"—these were high on the list of *Navion* owner-comments. The ability of the thick-skinned, all-metal *Navion* to stand punishment, and the sturdy tricycle landing gear with its oversized wheels and tires, are some of the reasons why the *Navion* excels.

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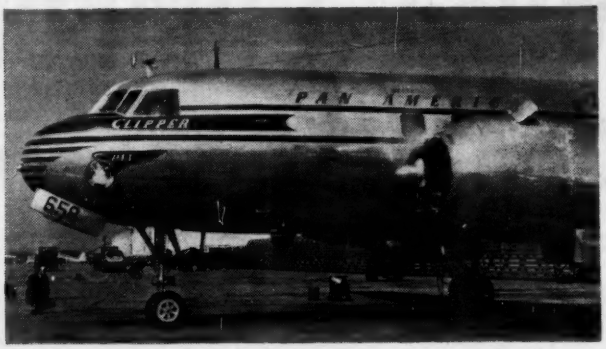

CONVAIR-LINERS GETTING AROUND

While American Airlines Convair-Liner, (left), first of two placed on regular cargo service last month, warms up at LaGuardia Field to start its five-weeks' cargo service which will hit all 69 cities served by American and cover 100,000-miles, Pan American Airways (right) warms up a Liner at San Diego prior to delivery flight. (Right photo, Ross-Pix)

PAA Maintenance

Huge new base at Miami, when complete in two years, expected to be world's largest.

Pan American Airways has embarked on a two-year program to set up the world's largest airline maintenance and overhaul shops at Miami International Airport.

It has leased nine buildings of the former Miami Air Depot from the Dade County Port Authority. With the exception of DC-3s (which go to Brownsville, Tex.), all PAA planes on the Latin American and Atlantic Divisions —and possibly the Pacific Division— will be sent to Miami for airframe and engine overhauls.

▶ **Outside Work**—Some engine work will also be done by Pan American for other carriers serving Miami. The new base will be able to overhaul 300 1350-hp. DC-4 engines a month—or roughly the equivalent in other types of engines.

The $2,500,000 to be spent on the base will be used to rehabilitate the buildings, equip them with modern overhaul facilities, and move the shops to the new location. PAA estimates the expansion will result in employment of nearly a thousand more machinists, technicians and inspectors. This will be a substantial boost to its Miami payroll which already totals $25,000,000 annually.

▶ **Area**—Built for the Air Forces during the war, the nine depot buildings on the west side of Miami International Airport contain about 1,170,000 sq. ft. of floor space. Coupled with 350,000 sq. ft. of space for aircraft overhaul and line maintenance in PAA's present hangars, the new facilities give the carrier a total of 1,522,000 sq. ft. for overhaul.

Miami was selected as the maintenance and overhaul headquarters for Pan American's operations over determined bids from New York, Chicago, Seattle, Los Angeles and Hartford, Conn. Had the shift been to one of these cities, more than 2000 PAA workers would have been moved out of Miami.

Atlas Corp. Asks Deal With CAB

Atlas Corp. is seeking means of avoiding a formal CAB investigation into the degree of its control over Northeast Airlines and Consolidated Vultee Aircraft Corp.

CAB last month (AVIATION WEEK, Mar. 15) instituted a probe to determine whether Atlas has, in fact, acquired control over both the air carrier and the aircraft manufacturing company and whether such control is in the public interest. The Board is especially interested in the Atlas-Convair-Northeast relationship because NEA potentially is a customer of Convair.

▶ **Plane Purchase**—Last August, Convair and Northeast signed an agreement whereby the airline would buy five Convair-Liners to be delivered in 1948. At the same time they negotiated a supplemental pact whereby NEA had the option to reduce its commitment from five to three planes or to cancel its order without liability except for forfeiture of the $25,000 initial payment. The option expires May 1.

In a letter to CAB, Atlas said the proposed hearings and investigations would involve substantial expenditures of time and money and suggested an alternative procedure. Atlas refused to admit it controls both Northeast and Convair. But to avoid the full investigation, the investment concern suggested that action be taken to assure that dual control could not be exercised by Atlas even if it were assumed that such control exists.

▶ **Stock Transfer** — Atlas indicated it would be willing to dispose of all, or a designated minimum percentage, of its stock holdings in either Convair or NEA. The investment company wants the choice of which stock to sell. Pending such disposition, Atlas would deliver all its shares of Northeast stock to an independent custodian or trustee selected with CAB approval. Atlas would relinquish its voting rights to the stock while it was held in trust.

The investment company asked 18 months time in which to dispose of the designated number of shares. It said this period was necessary in order to avoid undue sacrifice in placing its shares on an unsettled market.

▶ **Holdings Listed**—Atlas owns 100,000 shares, or 20 percent, of Northeast's outstanding common stock. It also holds 76,959 shares, or 92.4 percent, of NEA's outstanding convertible preferred shares, plus $400,000 in promissory notes.

The investment firm owns 131,900 shares, or 11.4 percent, of Convair's common stock and is the largest stockholder in the manufacturing firm.

Receiver Asked for Alaska

Appointment of a receiver for Alaska Airlines, Inc., of Anchorage, Alaska, is sought by the Pacific Airmotive Corp. of Los Angeles, Calif., in a suit filed in federal district court at Seattle, Wash.

The aviation supply firm alleges that the airline has "failed, neglected and refused" to pay $63,528 which it claims is a back debt.

Alaska Airlines recently moved its terminus in the Seattle area from Boeing Field to Paine Field, north of the city, and signed a contract with Universal Aircraft Service & Repairs for certain maintenance work. It plans to have its own maintenance base at Paine Field as soon as construction of a hangar can be completed.

Matson Leases Maintenance Base

Matson Aviation Maintenance Co., subsidiary of the Air Transport Division of Matson Navigation Co., has leased its maintenance, conversion and overhaul base at Oakland (Calif.) Municipal Airport to Transocean Air Lines. Matson had been operating at Oakland for nearly four years, ever since it received a contract with NATS.

Orvis Nelson, Transocean president, says the work force of 200 will be held intact for servicing his company's ten C-54s, and planes of the Philippine Air Lines. If contracts develop that are now being negotiated with the government and commercial airlines, employment should reach about 800.

► **Hill Wants to Fly**—In liquidating its present aircraft holdings, Matson Navigation Co. gives no indication that it will give up its interest in operating routes between Honolulu and Portland-Seattle-Tacoma, where applications are now pending.

Two of three C-54s owned by Matson are now on lease to United Air Lines, with option to buy. The third C-54 is on lease to Trans-Carribean Air Cargo. No market has yet been found for several thousand dollars worth of spare parts now in the Matson shops.

Indications are that if Matson should be awarded a Honolulu route, it would start with new equipment.

Flying Tigers Report Record Freight Traffic

The Flying Tiger Line has laid claim to the top spot among the nation's transcontinental airfreight carriers.

By operating 1,250,000 freight ton miles in March, the company chalked up its biggest month of domestic business since its organization nearly three years ago. Last month's traffic compares with 809,000 ton miles in February, 700,000 ton miles in January, and 350,000 ton miles in March, 1947.

The Tigers conceded that one or possibly two other carriers flew more freight ton miles domestically in March, but point out that these lines had supplemental operations on non-transcontinental links. (Slick Airways flew about 2,100,000 freight ton miles in March.) The Tigers fly only a direct route between San Francisco/Los Angeles and New York/Philadelphia via Kansas City, St. Louis, Chicago, Detroit and Cleveland.

President Robert W. Prescott said his company has been providing daily transcontinental service with five C-54s. This fleet was recently increased to seven planes, which will permit the Tigers to expand operations to four daily transcontinental flights in the near future. Although freight is the principal Flying Tiger income, the company also is engaged in aircraft modification at its Burbank, Calif., base.

CAB Reproves Colonial For Challenging Branch

Stating that the carrier's allegations appeared "frivolous and dilatory," CAB unanimously has turned down Colonial Airlines' request that Board Member Harllee Branch disqualify himself from further participation in two route cases.

Despite the action of his colleagues, Branch said he will not take part in CAB's future decisions on the Middle Atlantic Area case and the Boston-New Orleans case. He stood by his earlier statement that he would not participate in the proceedings. In this way he seeks "to safeguard public confidence and to remove the possibility that any party might question the integrity of the Board and the fairness of its decisions."

Colonial had asked Branch's disqualification because (1) the Board member's son at one time had been employed by a law firm which represents Eastern Air Lines, one of the parties in the two route cases; and (2) because Branch had a "personal bias and prejudice against Colonial."

Eastern Railroads Ask Passenger Fare Boost

Eastern railroads have asked for Interstate Commerce Commission authority to increase passenger fares about one-half cent a mile. If granted, the boost will improve the competitive position of the airlines, which increased fares ten percent in April, 1947, and another ten percent last winter.

Proposed new railroad scale is 3 cents a mile for one-way coach fares (against the present 2½ cents) and 4 cents a mile for one-way Pullman fares (compared with the present 3½ cents). The railroads cited "unprecedented passenger service losses" due to sharply increased costs. Airline passenger fares currently average about 5½ cents a mile.

CAB SCHEDULE

Apr. 22—Prehearing conference on CAB investigation into adequacy of cargo service between the U. S. and Alaska. (Docket 3286.)

Apr. 26—Hearing on Pan American Airways' application to acquire all property of Uraba, Medellin and Central Airways and for transfer of UMCA's certificate. Postponed from Apr. 14. (Docket 3272.)

May 3—Oral argument in TWA-Hughes Tool Co. investigation. (Docket 2796.)

June 14—Hearing on Capital Airlines (PCA) mail rate case. (Docket 484.)

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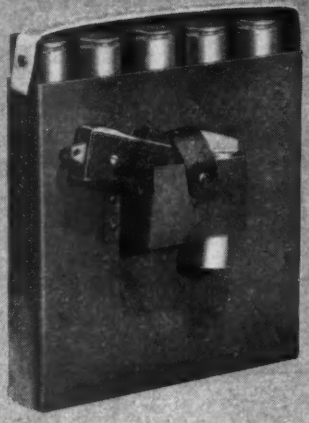

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DC-6S FLOCK TOGETHER

Seventeen DC-6s that either had been modified or were undergoing modification were assembled around American Airlines' Tulsa, Okla., maintenance base when this picture was taken recently. American expects to have all 50 of its DC-6s back in service by late spring.

Air Mail Rate Drive Stalls

Post Office proposes other plans to produce needed revenue.

The drive in Congress for an increase in air mail postal rates suffered set-back recently when Postmaster General Jesse Donaldson proposed a plan to offset the Department's mounting deficits without incurring any change of rates in airmail category.

Rep. E. Rees (R., Kans.), chairman of the House Post Office and Civil Service Committee, and other members of the committee who have already approved legislation boosting the airmail rate from five to six cents an ounce remain unconvinced that the deficit-financing condition of the Department can be corrected without the air mail rate boost. Members of the committee take issue with Donaldson's stand that an increase in air mail rates would give rise to decreased volume of business sufficient to ultimately result in loss, rather than gain, in revenue for the department.

▶ **Donaldson Plan** – Donaldson's revenue-increase plan for the Department estimated a bost of $243,970,000 in Department income. In addition, Donaldson pointed out, free postal services performed by the Department for other Federal agencies should be written off from the debit side of Post Office accounts. This amounts to an estimated $115,278,375 annually. The $115,278,375 write-off plus the contemplated $243,970,000 increase in revenue, a total of $359,248,375 would more than counter-balance the estimated Post Office Department deficit of $345,000,000 for the current fiscal year. Operating deficits were set at $148,082,835 for the 1946 fiscal year and $263,376,632 for the 1947 fiscal year. Deficits were laid to increases in cost of contractual services, increased charges on leased and rented quarters, increased costs on equipment and supplies, increased payments for mail transport, and salary boosts for postal employees.

Under the Donaldson Plan for increasing postal revenues postal card rates, publishers' second class mail, third, and fourth class mail rates would be boosted. In addition, charges for special handling services, special delivery service, money order's postal notes, registered mail, insured mail, COD mail, notices, and certificate of mailings would be raised. These increases would bring in the additional $243,970,000 in revenue.

▶ **Increases Proposed**–Of particular interest to the air transport industry, currently eyeing the establishment of an air parcel post system, is Donaldson's proposal for steep increases in surface-shipped parcel post rates. The major portion of his proposed revenue boost–$93,500,000–would be derived from increases in parcel post rates.

Surface parcel post rate increases suggested by Donaldson would bring these substantially closer the rates at which it has been estimated. Parcel post could be shipped by air. Following are the changes suggested:

- **First and second zone**–From 9.0 to 16 cents per ounce for the first pound, from 1.1 to 2.0 for each additional pound;
- **Third zone**–From 10 to 16 cents for the first pound, from 2.0 to 2.8 cents for each additional pound;
- **Fourth zone**–From 11 to 17 cents for the first pound, from 3.5 to 4.0 cents for each additional pound;
- **Fifth zone**–From 12 to 19 cents for the first pound, from 5.3 to 5.75 cents for each additional pound;
- **Sixth zone**–From 13 to 21 cents for the first pound, from 7.0 to 7.5 cents for each additional pound;
- **Seventh zone**–From 15 to 23 cents

for the first pound, from 9.0 to 9.5 cents for each additional pound;

• **Eighth zone**—From 16 to 25 cents for the first pound, from 11 to 11.5 cents for each additional pound.

LA to Have FIDO By Next December

Operational use of FIDO at Los Angeles Airport is expected to begin by next December.

Bids for installation of the first commercial system will be invited Apr. 20 by the Los Angeles Airport Commission.

▶ **Double Cost**—Cost is expected to be almost double that anticipated a year ago and may run as high as $800,000. The present proposal calls for the use of 390 Triad burners installed along 2000 ft. of the airport approach zone, and 4000 ft. of the airport's 6000 ft. main runway.

To date eight prime contractors have taken out plans for the system and have indicated that they will be competitive bidders.

Airlines which have agreed to underwrite the FIDO system will accept a bid cost of up to $750,000, but will require a new survey of installation costs if the bid exceeds that figure.

▶ **Engineering changes**—Reason given for the estimate of rising costs, is that since the project was contemplated numerous additional engineering requirements have appeared. The present plan calls for large oil storage tanks and extensive safety features not contemplated originally.

In addition, the airport management is providing for a ten percent storage of spare parts for the burner heads.

TWA Ad Campaign

Coinciding with the return of DC-6s to the transcontinental routes of American Airlines and United Air Lines, TWA has launched a special advertising campaign in newspapers and over the radio stressing the record of its Constellations during the winter season. The carrier said its Constellations completed 97 percent of their scheduled domestic mileage last winter despite severe weather conditions.

Exemption Denied

Trans-Caribbean Air Cargo Lines' request for an exemption authorizing scheduled air transportation of passengers and cargo between New York and San Juan, Puerto Rico, has been turned down by CAB. The New York carrier's application for immediate hearing on its bid for a route certificate also was denied.

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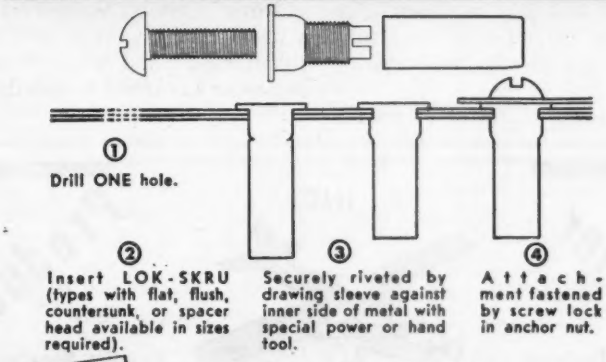
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Braniff Heads South

DC-6 service to Lima, Peru, via Havana now slated to start in June.

Braniff Airways has disclosed plans to activate late this Spring the South American Routes awarded to it in CAB's Latin American case decision almost two years ago.

In the company's annual report issued this month, President T. E. Braniff said service to Lima, Peru, via Havana, Balboa, Canal Zone, and Guayaquil, Ecuador, may be inaugurated in June. Extensions to Sao Paulo and Rio De Janeiro, Brazil, are planned shortly thereafter. First familiarization flight to South America was dispatched early this month.

▶ **Extension Eyed**—Date for opening service to Buenos Aires, the southern terminal of Braniff's Latin American system, will be announced as soon as an agreement has been reached between the U. S. and Argentina on the exact route to be followed. Problems incident to operating into Bogota, Colombia; Quito, Ecuador; La Paz, Bolivia; and Asuncion, Paraguay, are in the process of solution, Braniff stated.

The carrier noted it had tried unsuccessfully to contract for the use in Latin America of navigational, communications and terminal facilities owned and operated by Pan American Airways and Panagra. As a result, Braniff was forced to construct facilities of its own which will be completed in a few weeks.

▶ **Mexican Link**—Braniff's certificated route to Mexico City is still inactive because of the failure of the Mexican and U. S. Governments to effect a bilateral air transportation agreement. The carrier said it has the equipment and personnel necessary to inaugurate this service as soon as a pact is signed. An application for a temporary operating permit has been filed with the Mexican Government.

Braniff plans to use three of its six DC-6s in Latin American service. Resumption of domestic service with DC-6s is scheduled this month.

▶ **Deficit Reported**—The carrier reported an operating loss of $1,236,768 and a net deficit of $1,148,761 last year. This compares with an operating loss of $176,105 and a net profit of $34,-100 in 1946.

Despite its deficit in 1947, Braniff carried more passengers, mail and cargo than in any other year. Gross operating revenues reached a record $11,047,000. But the traffic increase failed to measure up to expectations, and total personnel was reduced from a peak of 2,530 in 1946 to about 2,030.

▶ **Losses Tentative**—The company noted that its losses are tentative, since an application is on file with CAB requesting increased mail rates retroactive to November, 1946. The Board was criticized indirectly both for its slow action in granting mail pay relief and for aggravating Braniff's competitive position by awarding new routes to other carriers. President T. E. Braniff said his company will press its own pending bids for new links to the Pacific Coast and to the Twin Cities.

Major factors in the decision to contract overhaul is the quantity of engines (about eight per day being the break point between contract and airline overhaul), shipping costs between airline base and contract overhaul facility and the pipeline of engines required to justify the time lag.

Airframe overhaul (8,000 hr.) should be contracted by small airlines using less than five aircraft to save the expenditure in equipment and manpower required for the job. Douglas Aircraft Co. disclosed that it is equipped for overhauling DC-3; DC-4; and DC-6s.

New KLM Service

Royal Dutch Airlines (KLM) has started a new weekly service between Johannesburg and Amsterdam using 43-passenger Lockheed Constellation transports.

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SHORTLINES

▶ **Air France**—Demand for trans-Atlantic accommodations this summer and fall is running 45 percent ahead of last year. Carrier is increasing its flight frequency to nine weekly on the Atlantic run effective May 19.

▶ **American** — Reports "appreciable gains" in load factors on transcontinental flights where DC-6s have replaced DC-4s.

▶ **American Overseas**—Has found that 50 percent of its Europe-to-U. S. passengers comes from England. German ranks second. Although only 18 percent were officially classified as emigrants, 42 percent of the westbound passengers said they would not return to Europe. Twenty percent were flying on business, 19 percent were visiting friends and relatives, and 11 percent were flying to America to be married.

▶ **BOAC** — All-cargo service between London and Johannesburg has been inaugurated in collaboration with South African Airways. Specially-converted Lancastrians with an 8000 lb. capacity will make one round-trip weekly.

▶ **Capital (PCA)**—Plans to offer all-expense, air-boat excursions on a time-payment basis this summer. Tours will include a flight from Washington to Buffalo and return, a trip to Niagara Falls, and a seven-day cruise of the Great Lakes. Cost of the tour may be covered in 12 monthly payments.

▶ **Chicago & Southern**—Company officials plan to make a survey flight soon to Kingston and Montego Bay, Jamaica; Aruba and Curacao, Netherlands West Indies; and Caracas, Venezuela. Flight marks the first survey of a route awarded C&S nearly two years ago and on which development activity was subsequently suspended by CAB.

▶ **Delta**—Reports freight shipments in first quarter 1948 were up 180 percent over the same 1947 period.

▶ **Eastern**—Plans to inaugurate service to Augusta, Ga., on June 1. Service to Lafayette-New Iberia, La., is to begin within 90 days.

▶ **Florida Airways**—Has received a year's contract to maintain CAA D-18 Beechcrafts used in the area.

▶ **Northwest**—Paid out about $3000 between Mar. 15 and Mar. 31 under its plan to give five percent fare rebates to passengers arriving at their destination over 30 minutes late.

▶ **Pan American**—International cargo shipments during March increased more than 15 percent over February and 50 percent over March, 1947. Cargo poundage on the Atlantic division alone for the first quarter of 1948 almost doubled volume of the same period last year.

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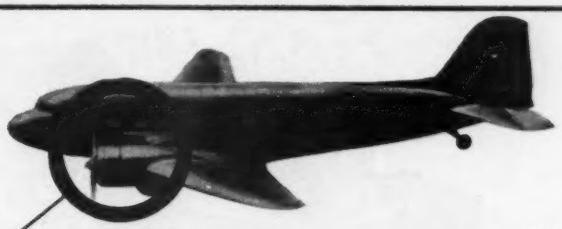

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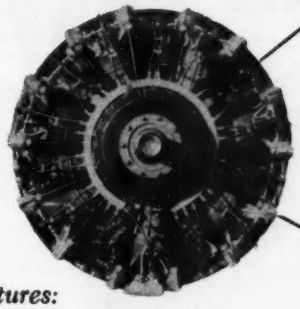

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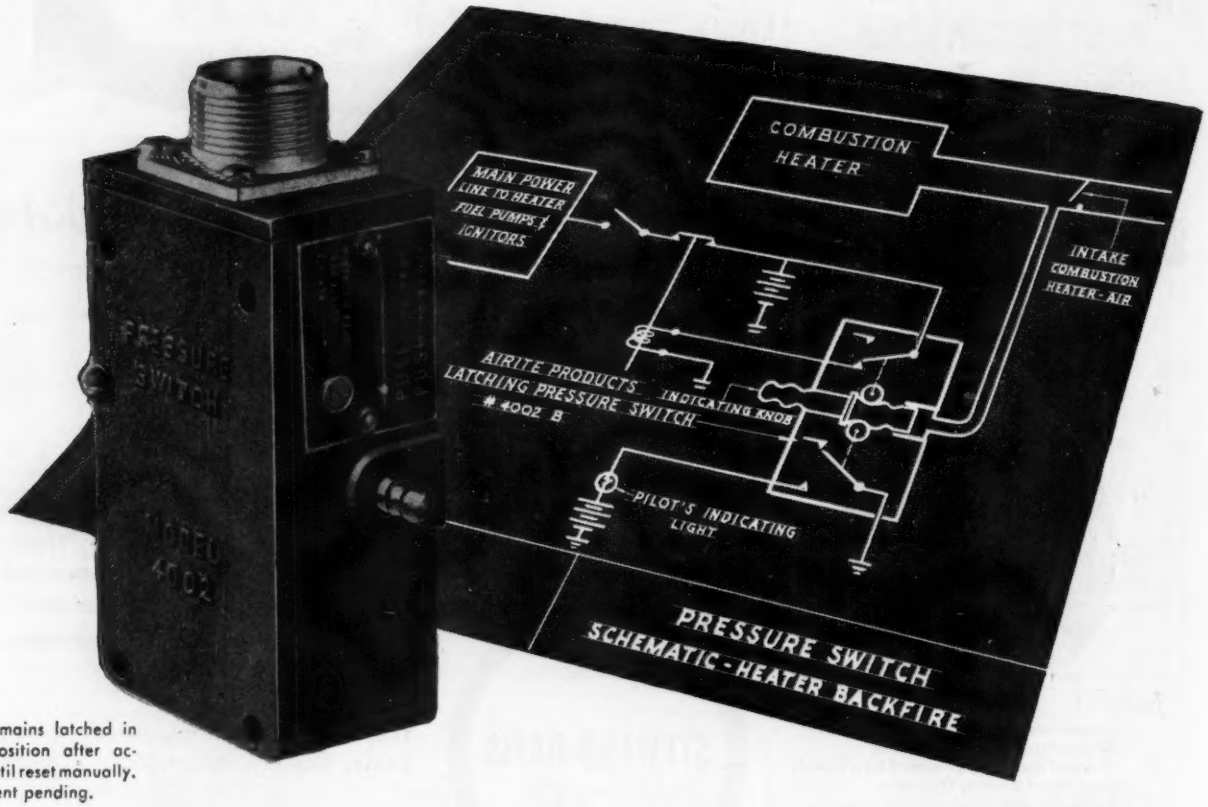
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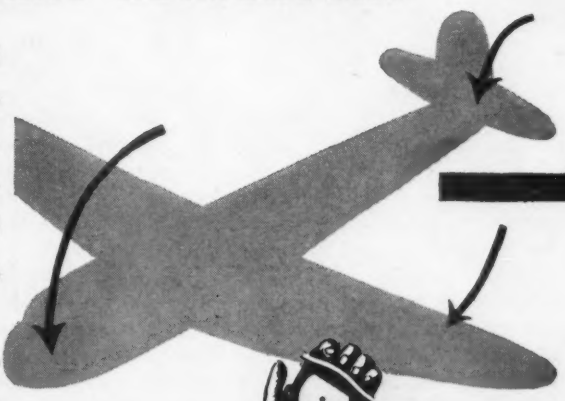

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The Betrayal of Air Power—III

The Truman Administration's scuttling of air power is backed by the Joint Chiefs of Staff and powerful battleship admirals.

While the debate continues on whether we are to build a 70-Group Air Force, these relics of the past give comfort to the President, Defense Secretary Forrestal, and Secretary of State Marshall in their stubborn refusal to subordinate the Army and Navy to a modern air armada.

Only one nation threatens the peace of the world.

Air Secretary Symington told the House Armed Service Committee that "Russia is building the world's greatest air force in order to reach a decision with this country, and they want to reach that decision in the air."

Symington said the Russians are now building 12 times as many planes per year as the United States. Since we are producing about 1800 per year that would give the Russians an annual production rate of about 21,600 planes. This is a disparity that very shortly could produce a numerical inferiority which could be disastrous.

If Mr. Symington is thought to be a prejudiced witness, hear what the Russians themselves say. The Communist Agitators Handbook, an official Russian publication for guidance of party workers, says in its Aug. 18, 1946 Edition:

> *"The aviation of the Soviet cannot lag behind that of other countries. . . . Soviet airplanes must fly higher, farther, faster than those of any other countries. . . . We must have the most powerful air force in the world."*

It is axiomatic that any military establishment can be gauged only when compared with its most likely opposition. A large force of cavalry might be the most successful method of invading Mexico but useless in taking Pacific Islands. It is simple logic that any consideration of our own defense needs must be based on estimates of Russia's capabilities.

The Russians, as we know, have the largest land army with better than 100 divisions under arms. Since the days of Napoleon the Russians have been extraordinarily successful in defeating land invasions of their country. Hitler tried it with 200 battle-tested and superbly equipped divisions and failed. It is folly to assume that the same factors which defeated Hitler would treat American foot soldiers any kindlier.

And our maximum ground effort in World War II was able to field only 90 combat divisions. Fighting a ground war with the Russians would be sheer folly and a combat that the Russians would welcome.

The Russians have virtually no navy and there are no signs that they are building one. The biggest bogey American admirals have been able to scare up is the Schnorkel long range submarine. And while Navy Secretary Sullivan publicly rants about Russia's 250 long range submarines, Naval intelligence service admits that there are really no more than 50 of these now available.

We already have the largest Navy in the world, and since a Naval building program is a long and costly process there is no possibility of this superiority being challenged in the forseeable future.

That brings us back to the air where we have sunk to a pitiful low, and where the Russians are bending every effort to reach their all-time peak. About 58 percent of the Russian military budget is devoted to air, while our Navy is still soaking up 40 percent of our military budget and the Air Force still ranks third when appropriations are passed out.

It is in the air that the first blows of any new conflict will be struck and even the bayonet-fighting generals of the Army and the blue-water battleship admirals of the Navy admit that they cannot operate except under a cloak of air superiority. Yet in this field we are being outbuilt at an annual rate of 12 to 1 and our highest defense councils—the Joint Chiefs of Staff—are still demanding that the Air Force continue in its subordinate role to the two senior services.

Since the Army and Navy can combine to lick the Air Force 2 to 1 in any Joint Chiefs of Staff decision it is easy to see the mechanics for squelching air power still exist despite the alleged independence of the Air Force.

At this late date we are still confronted with the spectacle of Admiral Louis Denfeld, Chief of Naval Operations, telling Congress that the Air Force must not be allowed to grow out of proportion to the Navy and Ground Forces:

> *"If it is the popular mandate that this country shall have a supreme and effective Air Force," he said, "the necessary sea and ground components must be currently provided otherwise national confidence in our expanded air power will not be resting on a sound foundation."*

Opponents of expanded air power, (including Admiral Denfeld who has confidence in more aircraft only if they are Navy aircraft and can be ruled by blue uniformed admirals) have been bombarding Congress with the theory that air power cannot operate without a large ground army to defend its bases and a large Navy to control the seas. Army Secretary Royall has been privately stating that 500,000 ground soldiers are necessary to defend every major air base overseas and the Navy has in its program to "supplement" the Air Force six 80,000 ton carriers that would cost $225,000,000 apiece.

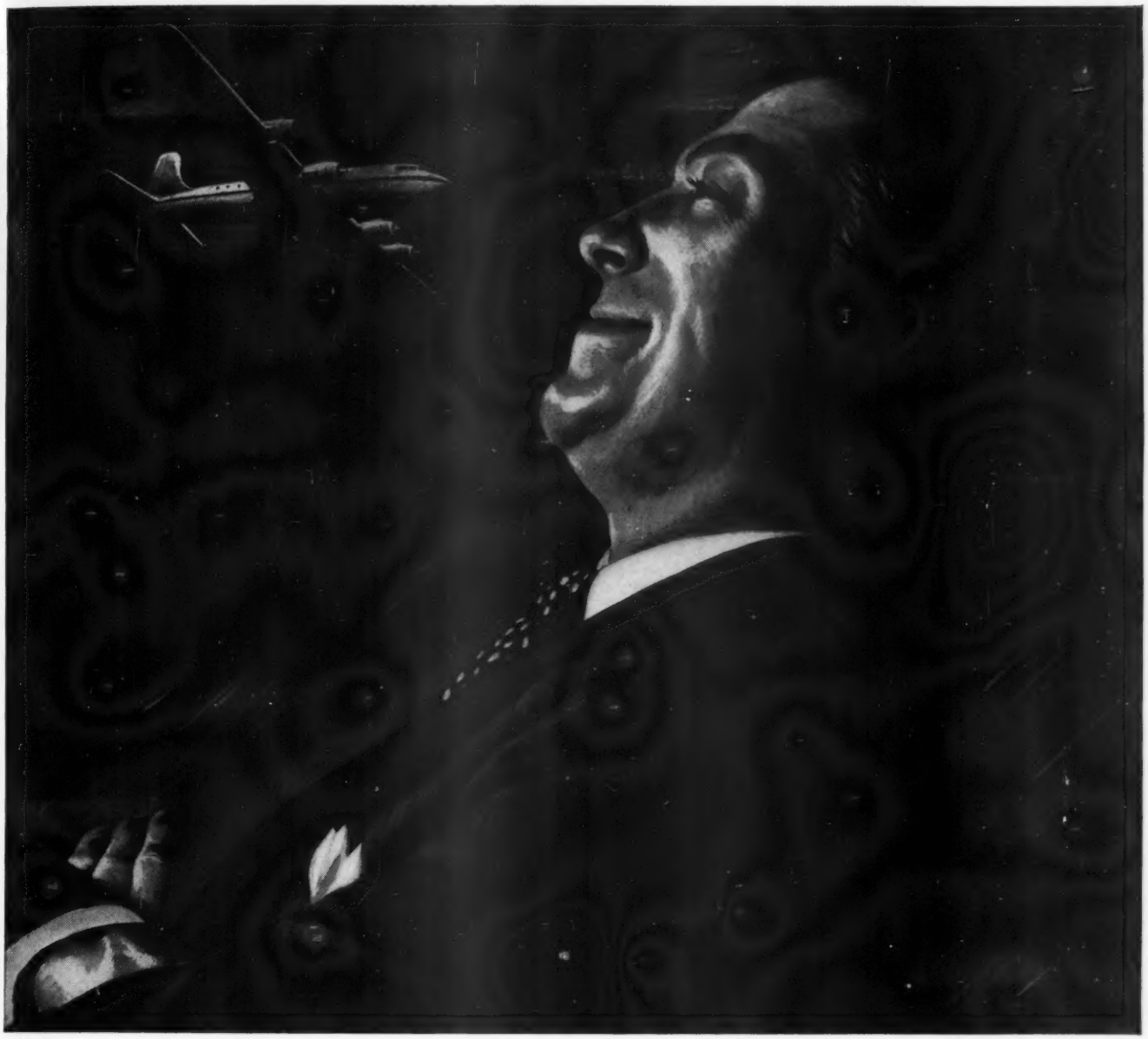
The point that all of them gloss over lightly is that control of the air is the first battle in any modern war and no war can be won without control of the air. Yet we are giving air power third priority.

In all the argument over the 55- versus 70-Group program the fact has been overlooked that the 70-Group program is the minimum **PEACETIME** airforce deemed necessary to national security. This was the unanimous decision of the Finletter Commission, the Congressional Air Policy Board and the President's Air Coordinating Committee. If the Truman administration is successful in forcing a 55-Group Air Force we will not have even an adequate peacetime Air Force. Yet, on the other hand, the Truman administration is shouting "crisis" and whipping up support for its other measures on the ground that we are on the brink of a grave international crisis. An Air Force adequate for that period would require, in the experts' opinion, doubling the production rate required for the 70-Group program. We now have less than half the production required for the 70-Group program.

On the need for land and seapower to defend air bases, there is the classic example of the Kenney-MacArthur campaign in the Southwest Pacific where, once air superiority had been established, battles were won with numerically inferior land and sea forces. Adroit use of the jungle and sea as barriers of air bases against land attacks eliminated need of large land forces solely tied to air base defense. If the Joint Chiefs of Staff can't figure out a better way to defend air bases than with 80,000 ton carriers and land armies, then they had better let the Air Force take over other barriers—ice wastes, desert, and jungle.

The latest maneuver of the Truman administration in trying to rush through a $2,376,100,000 aircraft procurement bill before the regular 1949 budget is approved is commendable in that it will permit immediate expansion of the aircraft industry. But it is also a smoke screen under which the administration hopes to hide the fact that it is still scuttling airpower. For of the $2,376,000,000, a total of $753,000,000 goes to the Navy for its aviation and the Air Force is still approximately a half billion dollars short of its procurement requirements for the 70-Group program.

ROBERT H. WOOD



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Bonanza-owner H. C. Bowers, retail furniture dealer of Salt Lake City, can now make all those buying trips he *should* have been making . . . and didn't. Has more time at the store, too. Increases out-of-town sales by flying customers to the home store. Bonanza travel pays . . . in *many* ways!

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